

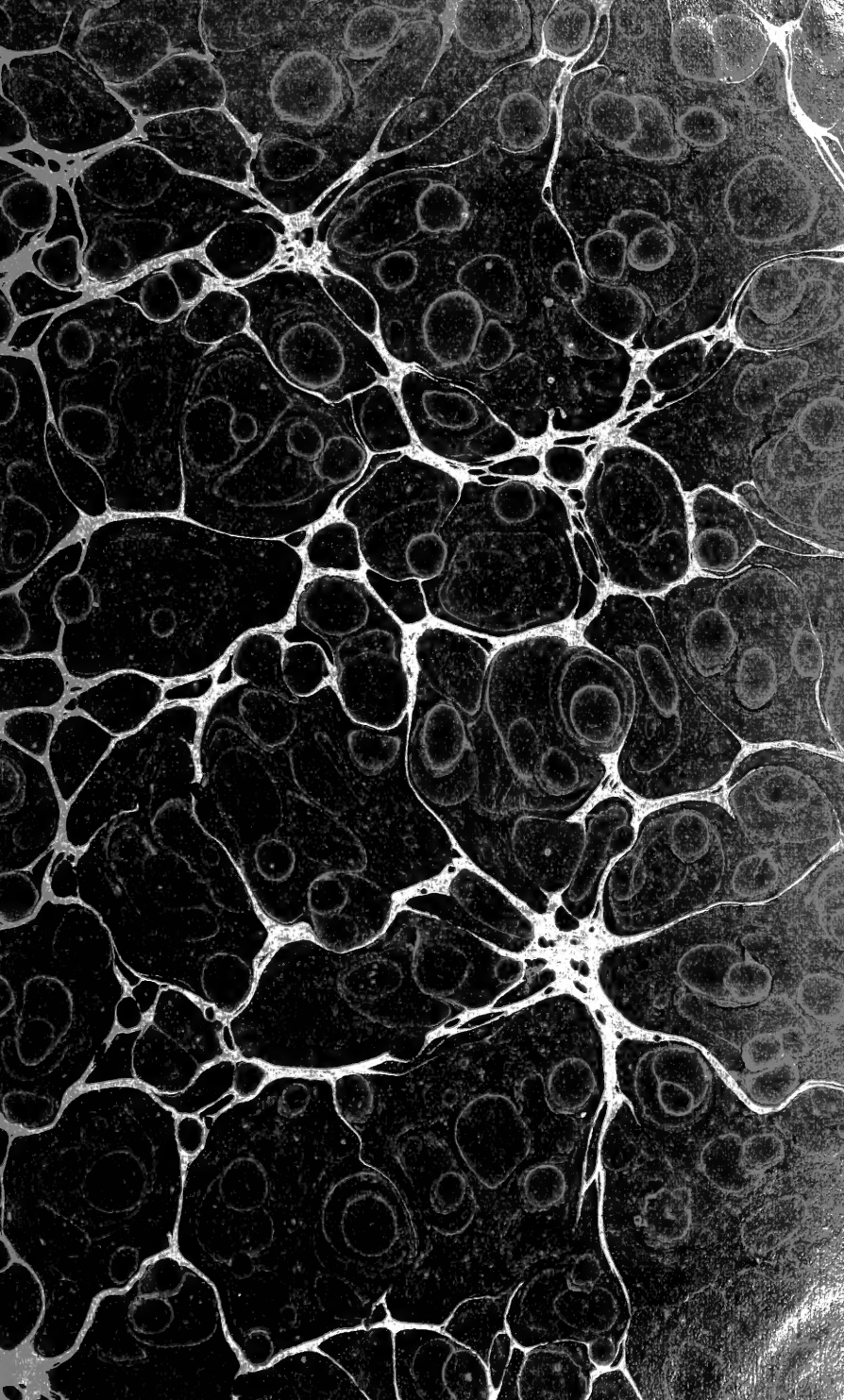


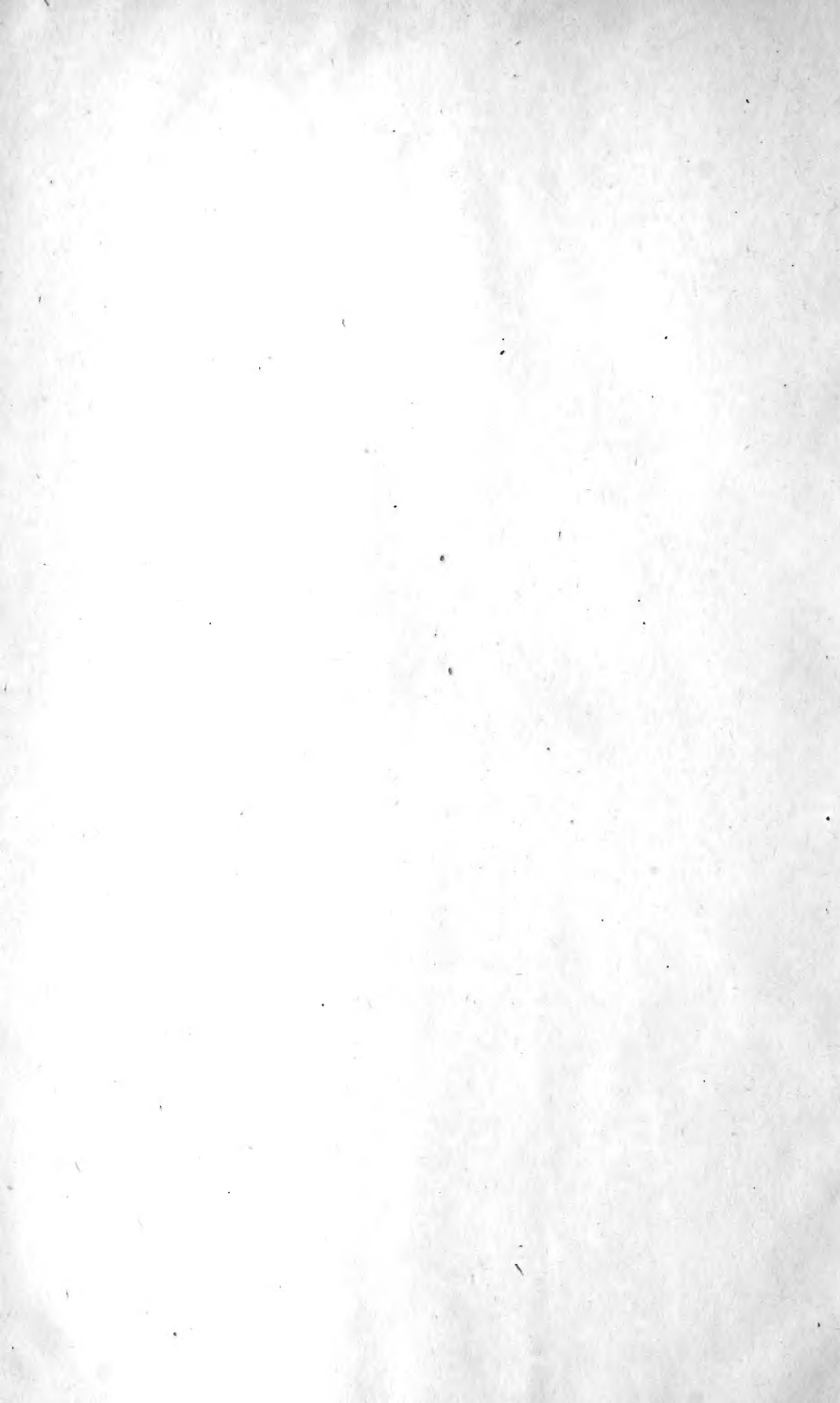


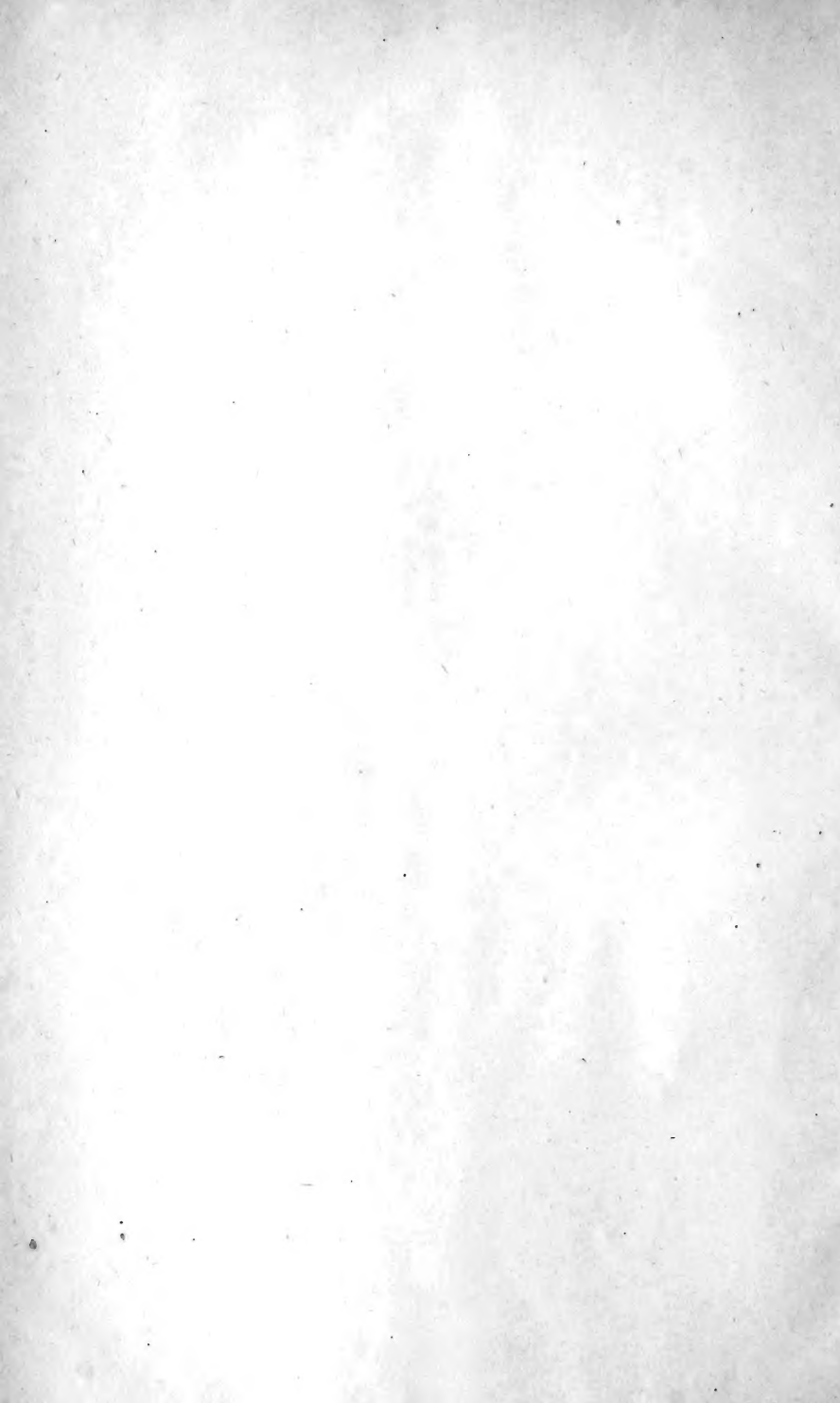
Class Q L 4 6 1

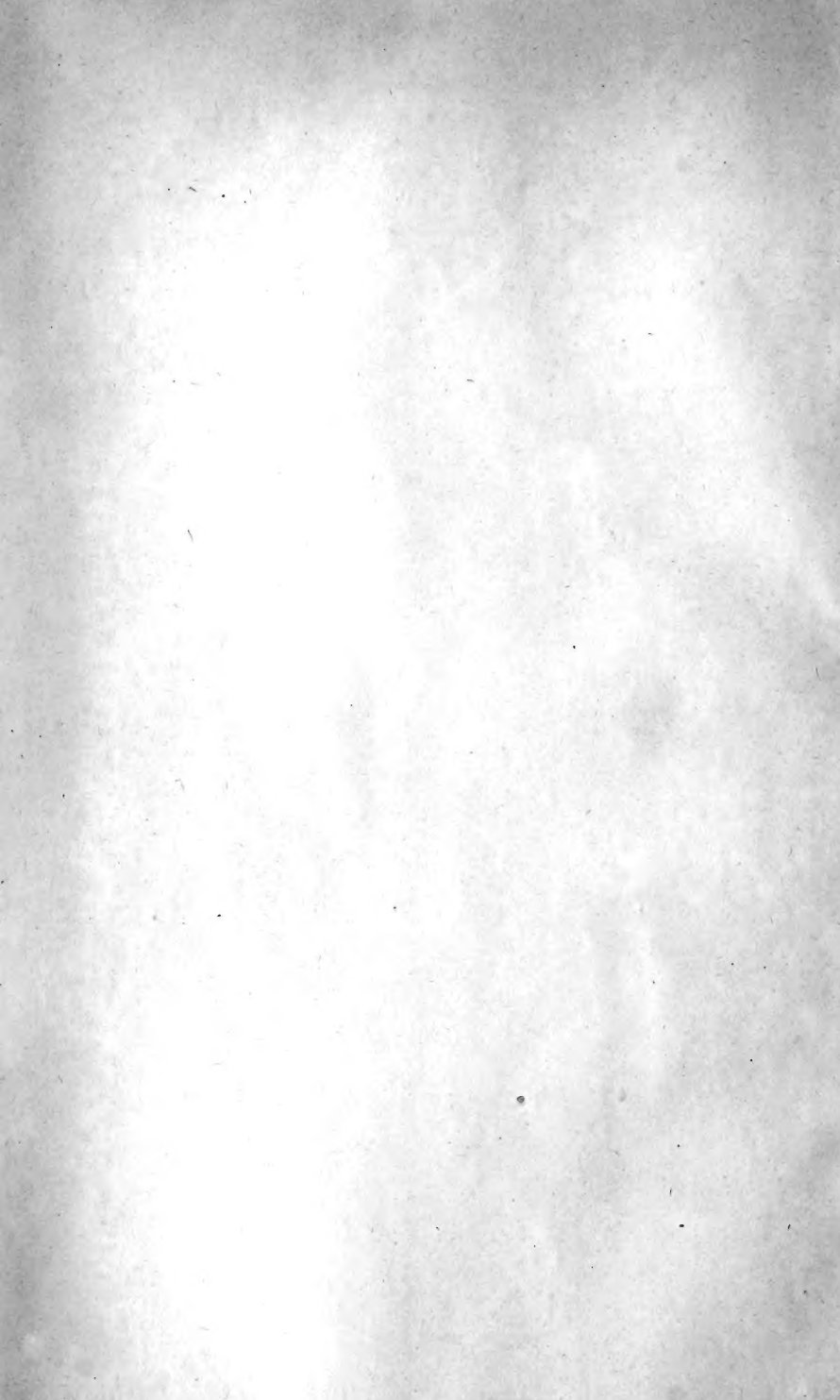
Book E 9 8 5

SMITHSONIAN DEPOSIT











5

12
581
274



THE
ENTOMOLOGIST'S RECORD
AND
JOURNAL OF VARIATION
EDITED BY
J. W. TUTT, F.E.S.

ASSISTED BY

T. HUDSON BEARE, B.SC., F.E.S., F.R.S.E.
GEORGE T. BETHUNE-BAKER, F.Z.S., F.L.S., F.E.S.
M. BURR, B.A., F.Z.S., F.L.S., F.E.S. (REV.) C. R. N. BURROWS
JAS. E. COLLIN, F.E.S. T. A. CHAPMAN, M.D., F.Z.S., F.E.S.
H. ST. J. K. DONISTHORPE, F.Z.S., F.E.S. ALFRED SICH, F.E.S.
GEORGE WHEELER, M.A., F.E.S.

VOL. XX.

JANUARY TO DECEMBER, 1908.

PRICE 10s. 6d.

Special Index (with every reference) 1s. 6d.

LONDON:

ELLIOT STOCK, 62, Paternoster Row, E.C.

28707

BERLIN:

R. FRIEDLÄNDER & SOHN,

11, Carlstrasse, N.W.

Q2461
E985

PREFACE.

WE have, with this number, concluded our 20th volume, the next, therefore, will be a "coming of age" volume. We hope to celebrate it with a "coming of age number."

The success of our last volume has probably exceeded that of any of its predecessors. This is particularly the case with regard to the illustrations, which, during the current year, have almost doubled those of any previous volume. For this success we are indebted to various members of the Editorial staff who have, in this matter, treated the magazine most generously. In all other matters, too, they have given their aid most ungrudgingly.

On the completion of our last volume we made a special appeal to correspondents for papers referring especially to British entomology; our pages show that the appeal was not made in vain, as collecting-notes, involving life-histories, details of dates, distribution, etc., have been received in increasing abundance; short notes involving observations of habits, etc., most interesting to the bulk of readers, are still earnestly besought. We also made a special appeal for annotated faunistic lists of the counties of Ross-shire, Sutherland, and other outlying parts of the British Islands; and have received in response thereto one of Ross-shire, which we hope to publish shortly. We again particularly appeal for notes and observations from all or any outlying part of the British Islands.

The lamented death of Mr. A. J. Chitty, so shortly after joining our editorial staff, is the first removal that we have encountered through death. It may be looked upon as the only real grief that we have suffered during our unusually vigorous and healthy childhood and youth. The kindness that we have generally met from entomologists willing to help us has hitherto not led us to seek a large number of names for official recognition, but so much time has recently been devoted to helping us in our investigations into the natural history of the lepidoptera, so great a part of which is reflected in our communications to this Magazine, by various lepidopterists of high standing, that we have felt constrained to alter this practice. The names and work of the Rev. C. R. N. Burrows, the Rev. George Wheeler, Mr. G. T. Bethune-Baker, and Mr. Alfred Sich, who have recently consented to join our staff, are too well-known to all lepidopterists to need introduction.

The General Index has again been compiled by the Rev. C. R. N. Burrows. The Special Index is in hand, and will be done by Professor T. Hudson Beare, Messrs. M. Burr, J. E. Collin, and H. J. Turner, all old and accurate workers in this direction. To all of these our best thanks are most gratefully tendered. Without, however, the continued help of the outside entomological public our labour would be in vain, and we, therefore, thank most heartily all our subscribers, contributors, and helpers in any form, for their continued kind support. We only hope that they will, on every possible occasion, introduce our Magazine to the notice of all, but particularly young, entomologists.

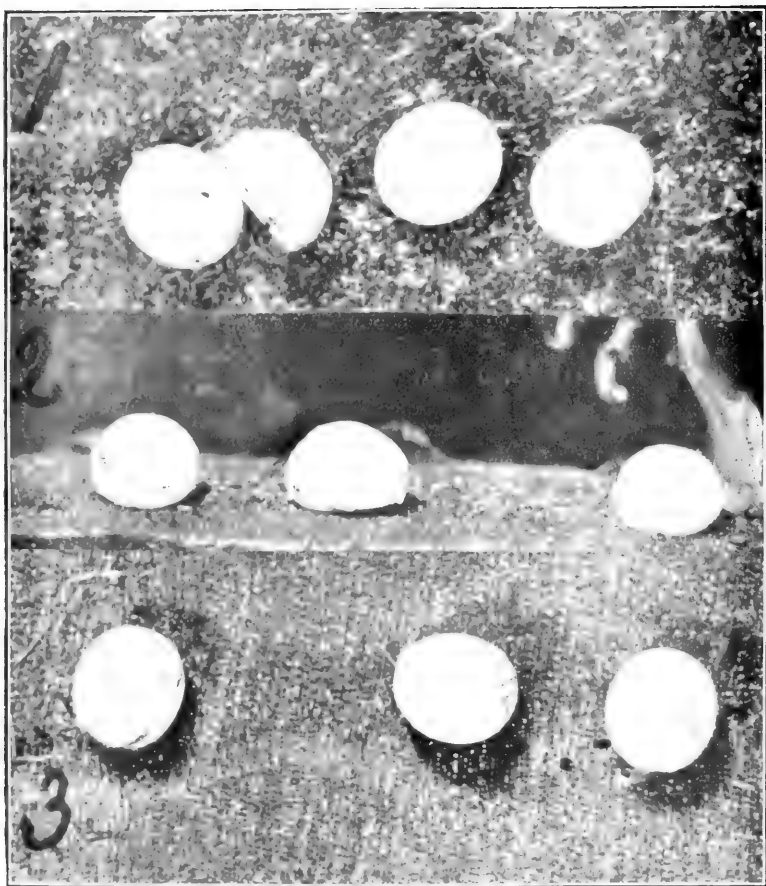


Photo. A. E. Tonge.

EGGS OF (1) *CYCLOPTIDES PALMON* AND (2-3) *C. SALATUS*. - 20.

The Entomologist's Record, etc., 1908.

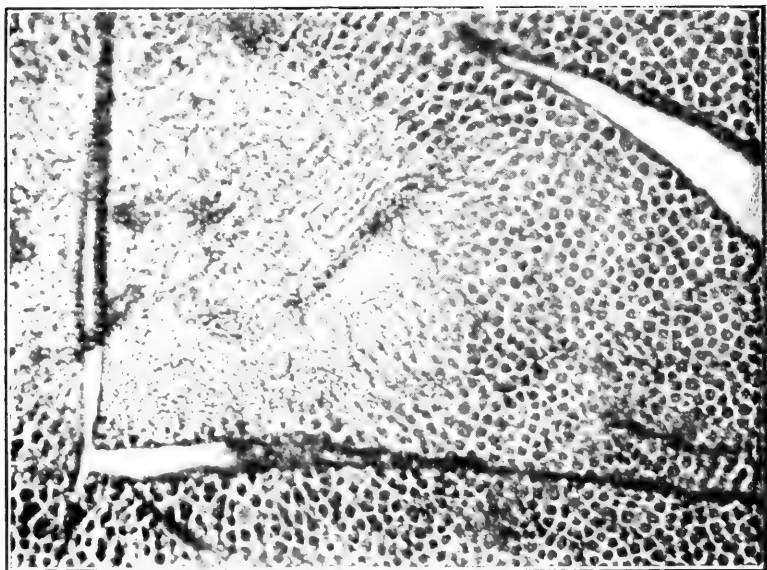
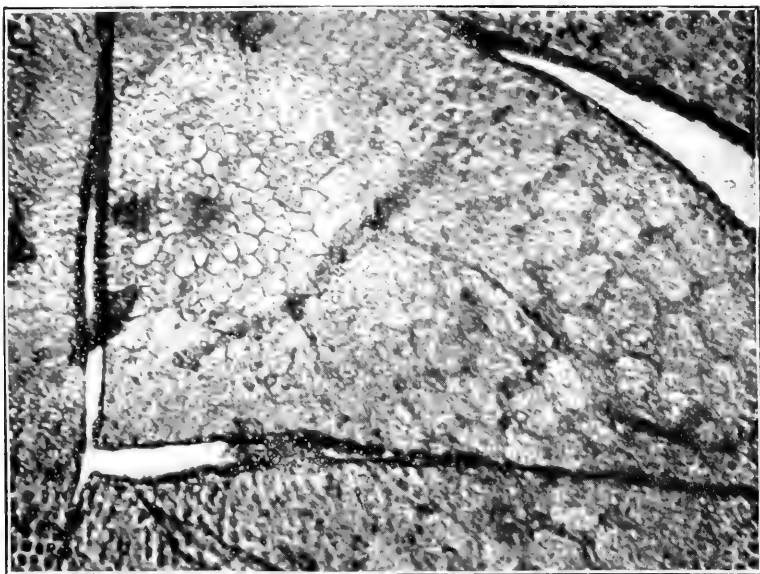


Photo. F. N. Clark

EGGS OF *CYCLOPIDES PALEMON*—MICROPYLAR AREA $\times 250$.

(Fig. 1 focussed to outer surface of eggshell. Fig. 2, to inner surface.)

The Entomologist's Record

AND

JOURNAL OF VARIATION.

VOL. XX. No. 1.

JANUARY 15TH, 1908.

Retrospect of a Coleopterist for 1907.

By Prof. T. HUDSON BEARE, B.Sc., F.R.S.E., F.E.S.

The year which has just closed has been marked by a greater increase to our list than I have had to chronicle for some years, and it is particularly interesting to note that two of the additions are species new to science. I begin, as usual, with an account of these additions to the list.

Haliphus immaculatus, Gerh. (*Ent. Mo. Mag.*, vol. xliii., p. 4). Mr. Newbery introduced this species on specimens taken by Mr. W. H. Tuck near Bury St. Edmunds. It is the most parallel-sided of the *ruficollis* group, and the dark lines are broader and more distinct than in *striatus*, Shp., and *fluvialilis*, Aub. Mr. Newbery gave a table to separate the four species of this group.

Laccobius sinuatus, Mots. (*loc. cit.*, p. 6).—Dr. Joy and Mr. J. R. le B. Tomlin took four specimens at Lundy Island in April 1906; it has also been taken at Cambridge (Gorham), and in North Wales (W. E. Sharp). In his "Coleoptera of the British Islands" (vol. i., p. 228), Canon Fowler says that *sinuatus* is a synonym of *nigriceps*, Thoms.; in coming to this conclusion he has apparently followed Dr. Sharp, who, in a revision of the British species of the genus (*Ent. Mo. Mag.*, vol. xxi., p. 85), said "the determination of Motschoulsky's *sinuatus* as *nigriceps* of Thomson is pretty certainly correct." The European authorities do not agree with this conclusion of Dr. Sharp; in both the first and second editions of the "European Catalogue of Coleoptera," and in Ganglbauer's "Die Käfer von Mittel Europa" (vol. iv., p. 253), *nigriceps*, Thoms., and *sinuatus*, Mots., are treated as distinct and separate species; Ganglbauer, however, says of *sinuatus*, Mots., "dem *nigriceps* äusserst nahestehend," and, in the table for separating the species of the genus, he relies upon one sexual character only, namely that the under-surface of the intermediate femora in *nigriceps* is thickly punctured and pubescent. The Rev. H. S. Gorham (*loc. cit.*, p. 54), referring to his Cambridge specimen, said he did not agree with the above opinion that they were *sinuatus*, and he described them as a new species *oblongus*. I must confess that this appears to me only to increase the existing confusion, and, in discussing Ganglbauer's character for the male of *nigriceps*, Mr. Gorham said that the "bristles" were only represented in his specimens by "short golden pubescence," but I would point out Ganglbauer himself used

JANUARY 15TH, 1908.

the word "pubeszenz"; the term "bristle" is due to Messrs. Joy and Tomlin. We have further, as a definite character, the thick punctuation of this portion of the intermediate femora of the males; in fact if the male characters given by Ganglbauer are to be depended upon, there can be no doubt that we have two species, though in general appearance they are very similar.

Paracymus aeneus, Germ. (*Ent. Rec.*, vol. xix., p. 254).—Mr. R. S. Mitford introduced this species on specimens taken by Mr. Harwood in North Essex, in 1898; this species has unicolorous red palpi, red legs, and is smaller and narrower than *nigroaeneus*, F.

Ochthebius viridis, Peyron (*Ent. Mo. Mag.*, vol. xliii., p. 172).—This species has been confused in our collections with *margipallens*, Latr.=*pusillus*, Steph.; both occur in this country (I have taken the latter at Rye). Mr. Newbery in introducing the species, gave a table to separate the four species of the group of the genus, which have two transverse impressions and an indistinct central furrow on the thorax. Ganglbauer gives the length of both the above species as 1.4mm.-1.5mm. Mr. Newbery says the length in both cases is 1mm., which, judging from my specimens, is too small.

Hydraena longior, Rey (*loc. cit.*, p. 172).—Mr. E. A. Newbery introduced this species, and is apparently of opinion that all the insects which have hitherto stood in our collections under the name of *H. angustata*, Stm., must be referred to *longior*, he gave characters for separating the two species, and stated that he had records of *longior* from Brockenhurst, Exeter, Polmont, and North Wales; from the records given by Ganglbauer for *angustata*, it appears rather unlikely that it will occur in this country.

Hydraena britteni, sp. nov. (*loc. cit.*, p. 79).—Dr Joy has described this new species from specimens taken by Mr. Britten in Cumberland; examples were sent to Ganglbauer, who was unable to identify them, but who was convinced they were not *nigrita*, Germ.; he suggested they might be *morio*, Kiesw., a species apparently confined to southeast Europe. After a careful examination Dr. Joy came to the conclusion that it was a species new to science; he found that the form of the terminal joint of the maxillary palpi in the males was a most important character, and, in his paper, he gave drawings to show the form of this joint in the males for the four species *britteni*, *riparia*, *nigrita* and *morio*; it is quite possible to separate the males of these species by this character alone.

Aleochara discipennis, Muls. et Rey (*loc. cit.*, p. 102).—Mr. G. C. Champion recorded this species as taken by Dr. Capron near Shiere, and by Commander Walker at Queendown Warren, in sheeps'-dung; it is like a small *fuscipes*, F., with antennæ like *lanuginosa*, Gr.

Phalacrus hybridus, Flach. (*loc. cit.*, p. 223).—Mr. E. A. Newbery has added this species to our list, in an article dealing with all the British species of the genus; he pointed out that it had been confused with the very common species *corruscus*, Pk., but might be easily separated from that species by the fact that its thorax was not alutaceous, as was that of *corruscus*. I find I had taken it at Sheerness.

Phalacrus championi, Guill. (*loc. cit.*, p. 224).—Mr. Newbery in the above article also introduced this species; he said that the insects formerly considered to be *brunnipes*, Bris., belong to this species, but,

as will be seen later on, I am of opinion that we cannot delete *brunnipes* from our list.

Gnathoneus nidicola, sp. nov. (*Ent. Rec.*, vol. xix., p. 133).—Dr. Joy described this species, new to science, from specimens taken in birds' nests; the describer stated that he found constant characters to separate it from *rotundatus*, Kug., which, moreover, never occurs in birds' nests; compared with this latter species it has broader anterior tibiae, which have also smaller teeth with flatter intervals between them, and the apex of the elytra is dull and closely punctured.

Enicmus fungicola, Thoms. (*Ent. Mo. Mag.*, vol. xliii., p. 103).—This species was found by Mr. H. Britten in fungus in Cumberland; in introducing it, Mr. E. A. Newbery gave a table separating it from *rugosus*, Hbst., and *testaceus*, Steph. Mr. Champion discovered that he had taken it at Aviemore in 1874, and recorded it as *rugosus*: it was also taken by Mr. Day in the Eden valley in 1901.

Cartodere argus, Reitt. (*loc. cit.*, p. 136).—Mr. Newbery stated that he possessed a specimen of this species, which was taken a few years ago in a wholesale druggist's shop in London; he had confused it with *C. filiformis*, Gyll., and was of opinion that it was probably not indigenous; it has very prominent eyes.

Cryptophagus subdepressus, Gyll. (*loc. cit.*, p. 225).—Taken near Strathpeffer, by Dr. Joy, by beating firs; in general shape and size it resembles *C. scanicus*, L., but the punctuation is much thicker, and the pubescence finer and shorter. Mr. G. Champion has taken it (1905) at Woking, and (1907) at Guildford.

Cryptophagus pallidus, Stm.—Dr. Joy also introduced this species of the genus as new to our list. It has probably been confused with *dentatus*, Hbst.; his attention was drawn to the matter by Mr. Britten. It has been considered by many authorities to be a form only of *dentatus*, but in Ganglbauer, and in the second edition of *The European Catalogue of Coleoptera*, it is considered a good species. Ganglbauer says that he finds the characters on which he relies for separating the two species are quite constant, and that *dentatus* is a bark insect, while *pallidus* occurs in flowers; in my own experience *dentatus* occurs far more commonly in haystack refuse than under bark.

Cis dentatus, Mellié (*Ent. Rec.*, vol. xix., p. 136).—Mr. Donisthorpe said this species was taken by Mr. R. S. Mitford at Sandown, Isle of Wight, by beating shrubs; in introducing it Mr. Donisthorpe gave characters for identifying it and separating it from *bidentatus*, Ol. He said it was superficially like *alni*, Gyll.

Apion kiesenwetteri, Desb. (*Ent. Mo. Mag.*, vol. xliii., p. 52).—This species Mr. Champion stated had been confused hitherto with *A. fuscirostre*, F. He gave characters to separate it, and stated that it occurred on *Genista tinctoria*; it had been taken by Mr. Holland at Sandown in 1906, by himself at Chattenden in 1872, and by Commander Walker in the same locality in 1873 and 1894.

As a result of one of the above records, apparently *Hydraena angustata*, Stm., must be deleted from our list, and, in his note on the species of the genus *Phalacrus*, Mr. Newbery also stated that, in his opinion, *P. humberti*, Rye, and *P. brisouti*, Rye, must be rejected, and that *P. brunnipes*, Bris., must disappear, but the first of these has generally been considered to be only a variety of *corruscus*, and, as Mr. Newbery confesses that he has not seen Mr. Rye's types, I am of

opinion that this variety must be allowed for the present to stand. In regard to *brisouti*, Rye, there seems to have been hitherto much confusion, due to the fact that, in the *Entomologist's Annual*, 1871, p. 67, Mr. Rye introduced into the British list *P. brunnipes*, Bris., on the strength of specimens taken by Dr. Sharp at Chatham and Lymington, by himself at Lee Pit, and by Mr. Champion at Gravesend, but in the *Ent. Mo. Mag.* for 1872, p. 8, he stated that he had, since he made the above record, submitted the specimens to M. Brisout, who stated that they were not his *brunnipes*, but a species new to science, and Mr. Rye then described them as *brisouti*, sp. nov. These specimens were also submitted to M. Tournier, who was then working at the family, and were declared by him to be new to science. Mr. Rye further stated that he had submitted another specimen from Mr. G. R. Waterhouse's collection to M. Brisout, and that gentleman had informed him that this insect was his *brunnipes*. Unfortunately, Canon Fowler, in his *Coleoptera of the British Islands*, vol. iii., p. 149, appears to have overlooked this correction by Rye of his first note, and has ascribed to *brunnipes*, Bris., all the records which belonged to *brisouti*, Rye, and I think this mistake has probably misled continental authors, and apparently Mr. Newbery was not aware of this unfortunate slip of Canon Fowler. Since we have Mr. Rye's statement that M. Brisout himself, who presumably had his own types before him at the time, declared that Mr. Waterhouse's specimen was his *brunnipes*, I am of opinion that that species is British and must remain in our list, especially as Mr. Newbery gives no reason for his assumption that the specimen of *brunnipes*—I would point out it is never anywhere called *brunnipes*, Rye—above alluded to is *championi*, Guill. I am further of opinion that *P. brisouti*, Rye, which is retained in the latest European catalogue, must also be retained in our list, until by an examination of Mr. Rye's type, which Mr. Newbery has not made, the insects are shown to be only a form of *corruscus*, Pz. My conclusion is that Mr. Newbery has introduced two new species to our list—*P. hybridus*, Flach., and *P. championi*, Guill., that he has wrongfully deleted *P. brunnipes*, Bris., and that *P. brisouti* must also stand for the present, and *humberti* also as a var. of *corruscus*, Pz.

Canon Fowler (*Ent. Mo. Mag.*, vol. xliii., p. 30) expresses his opinion that the specimen upon which Mr. F. Bouskell introduced *Aphodius sturmi*, Harold (*Ent. Rec.*, vol. xv., p. 92) is only a small immature *A. nitidulus*, F.; as I have not seen the specimen, I can offer no opinion upon the correctness of the original determination, but for the present the species must be relegated to the doubtful list.

Mr. Newbery (*loc. cit.*, p. 123) stated that he had submitted specimens of *Melanotus rufipes*, Hbst., and *M. castanipes*, Pk., to M. Bedel, who was of opinion that they were only forms of one species, and he further drew attention to the fact that *castanipes* is sunk as a synonym of *rufipes* in the latest European catalogue. To my mind this latter fact by no means settles the question, since, in the same catalogue, *Cryptohypmus pulchellus*, L., and *C. sabulicola*, Boh., are considered synonymous, and this they most certainly are not (see in confirmation of my opinion Mr. Gahan's note on the genus [*loc. cit.*, p. 121]). I must here raise a respectful protest against this tendency on the part of some of our coleopterists to accept the opinion of some continental authority, who, in many cases, has not seen the original types, as once for

all settling some difficult question of synonymy. Canon Fowler's remarks (*loc. cit.*, p. 30) on this point are well worthy of quotation. "The determination of continental authorities should not be accepted as absolutely final, without being verified, as is too often the case." In this case Mr. Newbery did submit some of Mr. Rye's specimens to M. Bedel, but as that gentleman speaks of *castanipes* as a "form," the whole matter turns once more upon the question of what is a species, and as I have taken specimens in the Highlands, and seen others taken there, which to my mind are far more distinct when compared with the ordinary forms of *rufipes* than is the case with many allied, but on all hands admitted, species, I shall myself for the present continue to consider *castanipes*, Pk., as a genuine species.

In a very interesting note (*loc. cit.*, p. 102) Mr. J. H. Keys showed that the insect known as *Aleochara morion*, Grav., has its tarsal formula 4, 5, 5: it is not, therefore, a true *Aleocharina*, but as it has the minute accessory joint of the palpi, it cannot be a *Myrmidonina*, it is intermediate, and he proposed for its generic name *Exaleochara*.

I have already alluded to the fact that Mr. Gorham has described *Laccobius oblongus* as a species new to science on what I consider to be insufficient grounds; that gentleman also introduced as new to our list (*loc. cit.*, p. 53) *Oxyptoda metatarsalis*, Thoms., on specimens taken in moles' nests; there can be no doubt, however (Mr. Gorham himself suggests the possibility) that these insects were *O. longipes*, Muls., which has long stood in our lists on the authority of a specimen taken by Dr. Sharp at Aberlady. In the latest European Catalogue *metatarsalis* is treated as a synonym of *longipes*, and the difference of habitat and locality on which Mr. Gorham relied is of no value, as I have this year taken in moles' nests at Lowestoft, and again by sweeping at the edge of a forest road in the Newtonmore district in Invernessshire, specimens between which a most careful examination fails to show the slightest difference, and both sets of specimens agree perfectly with the descriptions given for *longipes*, and those now given for *metatarsalis* by Mr. Gorham. When introducing *longipes* Mr. Rye stated that *metatarsalis* was a synonym.

In another note (*loc. cit.*, p. 205) Mr. Gorham expressed the opinion that we have a second species of *Simplocaria*, distinct from *semistriata*, F.; the two specimens on which he based his opinion are narrower than *semistriata*, darker in colour, and have deeper striae, which are continued almost to the apex of the elytra. Mr. Gorham thinks they are probably the insect alluded to by Stephens, as *picipes* of Olivier; this latter name is considered by Ganglbauer (*Die Käfer von Mittel-Europa*, vol. iv., p. 59) to be merely a synonym of *semistriata*, while, since Mr. Gorham says the two specimens are smaller than average *semistriata*, they can hardly be *picipes*, Gyll., which is considered by Ganglbauer to be a synonym of *metallica*, Stm. I am afraid that, until Mr. Gorham can give more definite information, this proposed addition must be placed in the doubtful list.

The valuable paper by Mr. G. A. Crawshay on "The life-history of *Tetropium gabrielli*, Ws.," to which I shall allude later on, makes another deletion from our list necessary, namely, *Tetropium crawshayi*, Shp., as it is shown to be only a synonym for *gabrielli*.

One new variety has been added to our lists, *Ctenioporus sulphureus*, L., var. *bicolor*, F., taken by Mr. Donisthorpe at Deal.

Summing up, we have fifteen undoubted additions to our list, and

one which should go in my suggested list of introduced species, and lastly one doubtful addition (the *Simplocaria*), while, on the other hand, two names disappear, and another may have to go if further examination confirms Mr. Newbery's views as to *Phalacrus brisouti*, Rye.

The retrospect this year will be of such unusual length that I am compelled to curtail considerably my references to the captures of rare species during 1907, and can only allude to a few of the more important. Mr. H. J. Thouless has again captured *Oedemera virescens*, Linn., near Norwich, and *Malachius barnerillei*, Puton, at Hunstanton. Mr. P. de la Garde has taken *Arena octavii*, Fauv., at Dawlish Warren, and he gave, in recording the capture (*Ent. Mo. Mag.*, vol. xliii., p. 124), a description of it and the characters which separate it from *Phytosus balticus*, Kr., it has also been taken by Mr. Attle at Llanbedr, Wales. Mr. West has taken *Oxytaenus variolosus*, Duft., at Darenth, and Mr. P. de la Garde has found *Hydrochus nitidicollis*, Muls., in flood-refuge from the River Teign. *Trichonyx sulcicollis*, Reich., has been found in the New Forest by Mr. Champion and Commander Walker; the former gentleman has taken *Cryptophagus cylindrus*, Kies., at Chobham, and *Dorytomus tremulae*, Pk., and *Melanophthalma similata*, Gyll., near Guildford, and *Rhizophagus coeruleipennis*, Sahlh., at Woking. Mr. P. de la Garde also took this species out of flood-refuge in the River Teign. At St. Margaret's Bay I found *Hypera tigrina*, Boh., and *Apion semirittatum*, Gyll., in numbers, and Mr. Donisthorpe found the latter insect plentifully at Deal. Many of the moles' nest specialities have again been found in various parts of the country, such as *Onthophilus sulcatus*, F., at Coulsdon, Mr. Bedwell; *Quedius longicornis*, Kr., at Guildford, Mr. Champion; *Medon castaneus*, Gr., at Oxford, Commander Walker; *Quedius vexans*, Epp., and *Hister marginatus*, Er., in Scotland, near Strathpeffer, Dr. Joy. *Euplectus minutissimus*, Aub., has again turned up at Great Salkeld to Mr. Britten, and at Winlaton-on-Tyne to Mr. Bagnall. Mr. Britten has also found the rare little weevil *Ceuthorrhynchidius posthumus*, Germ., on its foodplant at Great Salkeld. Mr. Donisthorpe secured several specimens of *Magdalis duplicata*, Germ., at Newtonmore, during our Highland trip, and we found, last April, *Quedius riparius*, Kell., in some numbers in its old locality at Porlock.

Several interesting papers have appeared during the past year in the entomological journals. Dr. Joy and Mr. J. R. le B. Tomlin (*Ent. Mo. Mag.*, vol. xliii., p. 27) have described, in a paper entitled "Further Notes on the Coleoptera of Lundy Island," the results of their visit to that island in April, 1906, the total number of species of coleoptera now recorded from the island amounts to 462, a surprising total from such a limited area; some of the species found on the island are most unexpected. I have myself been recently naming a collection made on St. Kilda by Mr. Waterston, and have also had submitted to me a list of beetles obtained by Mr. Gordon Hewitt during a visit to the island, and also a list prepared by Dr. Joy from specimens obtained from birds' nests, moss, etc., sent to him from the island; as a result the complete list, which will appear in the January number of the *Annals of Scottish Natural History*, will bring up the record from St. Kilda to 111 species. I have recently been making arrangements which will, I hope, enable me during 1908 to begin an exhaustive study of the coleopterous fauna of the smaller islands which lie round the coast of Scotland.

Life-histories are dealt with in two papers, namely, in Dr. Bailey's note (*loc. cit.*, p. 3) on the occurrence of *Rhizophagus parallellocollis*, Er., in buried corpses, and in Mr. Morley's records of his field-observations on the occurrence of coleoptera in vertebrate carrion (*loc. cit.*, p. 45); during ten years he had noted 113 species, and of these certain species are not genuine carrion feeders, but were merely sheltering beneath it.

Questions of synonymy, specific characters, etc., are the main features of three valuable papers. Mr. C. J. Gahan (*loc. cit.*, p. 121), in his paper "On the Elaterid genera *Hypnoidius*, Steph., and *Cryptohypnus*, Esch.," showed that the former genus must stand, and that its type is *riparius*; he also proved that *sabulicola*, Boh., and *pulchellus*, L., were perfectly distinct species. Mr. A. J. Chitty (*loc. cit.*, p. 164), in his paper "Notes on the genus *Cryptophagus*, with a table of species," has embodied the results of a careful research into the characters of the species of the genus which occur in this country, and as a result of his work he has been able to prepare a table which will greatly simplify the work of those collectors who have hitherto found considerable difficulty in identifying their captures. I have already myself found the table of much use in revising my own exponents of the genus. I find, however, that I have taken *umbratus*, Er., fairly commonly in refuse in my own garden, and I do not consider this species is as rare as Mr. Chitty seems to think. The third paper (*Ent. Rec.*, vol. xix., p. 77) is by Mr. F. Balfour Browne on "The Specific Characters of *Hydroporus incognitus*, Shp.,"; the paper is illustrated by a carefully drawn plate. The author is able to show quite clearly from his dissections and drawings that *incognitus* is quite distinct from *palustris*.

Mr. Donisthorpe has continued his researches on the inhabitants of ants' nests, and in two papers (*loc. cit.*, pp. 4 and 254) has summarised the results of his work in the field, and of his careful observations with his experimental nests; the year has been remarkable for the large number of specimens of *Lomechusa strumosa*, F., which have been found at Woking. Mr. Donisthorpe, I may mention, had a most interesting exhibit at the annual soirée of the Royal Society in May last, which attracted much attention; the success which has crowned Mr. Donisthorpe's patient and laborious investigations in this field of work show how good it would be if every one of our coleopterists were thus to map out a field of study for himself, and to abandon the idea that to fill store-boxes or cabinets with rows of neatly-set specimens is the only ambition of an entomologist.

The *Transactions of the Entomological Society of London* for 1907 are of exceptional interest to the coleopterist, and as Parts iii and iv of 1906 did not appear until January 23rd, 1907, I must also deal with them. The first paper in Part iii of 1906 is by Prof. Poulton, on "Predaceous insects and their prey" (p. 323), a most valuable memoir, containing a perfect mine of information. In the table of insects attacked by *Asilidae*, I find forty species of coleoptera, mostly conspicuous day-fliers and flower-haunters, and about half of them specially protected; the records of attacks on coleoptera by predaceous insects of the orders Neuroptera and Hemiptera are too few to allow any conclusions to be drawn, and, strangely enough, there are only eight records in all of attacks by predaceous coleoptera on brethren of their

own order; the scanty records are probably due not so much to want of observation on the part of our field naturalists, as to the fact that by far the larger proportion of predaceous coleoptera are nocturnal insects, and seek their prey, therefore, at a time when observation is almost impossible. It would be a great advantage in obtaining such records if every field-worker would provide himself with a note-book as part of his equipment, in which notes of attacks on insects could be recorded at the time they are observed; it is not always possible to capture the aggressor. Valuable as are the records given by Prof. Poulton, in my opinion they are at present too few in number to allow of any generalisation from them; when one considers the enormous number of attacks by predaceous insects which must constantly be going on in all parts of the world, and how very few of these can come under observation, it seems rash to conclude that the records are necessarily averages of the whole number.

In the same part of the *Transactions* appeared (p. 441) Mr. G. J. Arrow's paper, "A Contribution to the Classification of the Coleopterous Family *Passalidae*." The author pointed out that the remarkable secondary adaptation of the wings to serve as organs of sound-production is accompanied by a tendency to the loss of their primary function, and species are found, in different parts of the family, in which they are already useless for flight. As a result, locomotion has become restricted, and segregation into local forms has been brought about, which is too recent for marked specific differentiation. Mr. Arrow has endeavoured to correct some of the errors into which Kuwert had fallen owing to the latter's attempt to achieve finality without having a sufficient amount of material for study. The remainder of the paper is devoted to a description of one new species from Granada, and of eighteen other new species of the family, the types of which are in the British Museum.

In Part i of the *Transactions* for 1907 (issued on June 20th) are four papers of interest to coleopterists. Mr. E. A. Elliott and Mr. C. Morley in their memoir "On the Hymenopterous Parasites of Coleoptera" (p. 17) have brought together into a convenient form for reference a large number of records scattered through British and continental magazines, and in such works as Ratzeburg's "*Ichneumonien der Forstinsekten*"; this paper will be most useful for reference purposes to entomologists working at the economic side of our subject, since it is to these hymenopterous parasites that we must look for a real effective check upon the ravages of the Scolytids and other destructive beetle-pests.

The second paper (p. 83), by Mr. R. Shelford, on "The Larva of *Collyris emarginatus*, Dej.," is illustrated by a plate; there is a full description of the larvæ, and an account of its life-history; this Cicindelid larva burrows in the central pith of twigs of the coffee shrubs in Java, its food being the ants and aphides which frequent the shrubs, and it finally pupates in the burrow; its life-history is, therefore, very similar to that of the larva of our common *Cicindela campestris*, L., whose burrows may be found in sandy spots in districts where it occurs. In an addendum an account is given of the habits of another Cicindelid wood-boring larva found at Hong-kong by Mr. Muir; it appears to be the larva of another species of *Collyris*.

Mr. A. M. Lee, in a paper (p. 135) entitled "Catalogue of the

Australian and Tasmanian *Byrrhidae*, with Descriptions of New Species," described seven new species of the genus *Pedilophorus*, and also gave a list of all the previously described species of the family.

The last paper in this part is one by Dr. Chapman and Mr. G. C. Champion on "Entomology in N.-W. Spain (Galicia and Leon)," describing their sixth entomological journey to the peninsula, this time to its north-west corner; the visit lasted from mid-June to mid-July, and, after an account of the route traversed and of the natural features of the country in which they collected, the authors give brief lists of the species collected, with notes as to their habits and localities. Mr. Champion is responsible for that part which deals with the coleoptera.

In Part ii of the *Transactions*, issued on September 26th, are several papers dealing with coleoptera; the first (p. 183), by the Rev. G. A. Crawshay, deals with the life-history of *Tetropium gabrielli*, Ws., and is illustrated by six excellent plates. This is one of the most interesting papers to British coleopterists which has appeared in the *Transactions* for several years. Mr. Crawshay has bred this species right through from the egg to the imago, and has given a complete account of all the stages and of the habits of the larvæ; the methods he adopted for breeding the insect and, at the same time, keeping the larvæ under close observation were most ingenious, and reflect great credit upon the author; perhaps the most remarkable of his experiments was the breeding of the perfect insect within three months of the egg-laying of the parents, entirely in the open air, due to the exceptional heat of the summer of 1906. The success which has attended Mr. Crawshay's work will, it is hoped, induce other coleopterists to attempt similar experimental research with others of our longicorns.

Mr. Kershaw and Mr. Muir contributed a paper (p. 249) on the egg-cases and early stages of some South China *Cassilidae*, in which they described the egg-cases and larvæ of four species—*Optocyclus circumdata*, Hbst., which does not cover the egg-case with excremental matter; *Aspidomorpha micans*, Fab., which, sometimes in captivity, but never in nature, partially covers its egg-case with excrement; *Laccoptera chinensis*, Fab., which usually covers its egg-case with excremental matter; and, lastly, *Cassida obtusata*, Boh., which always has bare egg-cases. The authors express the opinion that, at present, it is not possible to state definitely that these egg-cases are solely for protection against enemies or drought.

The last paper in this Part (p. 309) is a joint one by Messrs. Dixey and Longstaff, descriptive of their entomological observations and captures during the visit of the British Association to South Africa in 1905. As these gentlemen were almost constantly on the move during the eight weeks they spent in the sub-continent, and as they were collecting insects of all orders (they secured 2500 specimens in all), they could of necessity only skim the surface, so to speak, of the collecting possibilities, yet they added several new species to the lists of the fauna of South Africa. The number of species of coleoptera collected was small, and I am afraid not much additional information as to the geographical distribution of the species of this order has been brought to light by their work; no one who has not been trained to

collect coleoptera, can possibly fairly sample the beetles of any district during such a hurried journey as this was.

In Part iii of the *Transactions*, which was issued on November 20th, appeared a list of the coleoptera of the Maltese Islands, by Mr. M. Cameron and Mr. A. C. Gatto. The actual list is preceded by a general description of this group of islands, and a few notes on the previous information which has been published in regard to the Maltese coleoptera. Further researches will no doubt add largely to the list the authors have been able to compile.

The second edition of Heyden, Reitter, and Weise's *Catalogue of the Coleoptera of Europe* has this year become available to students; this thick volume of 750 columns is an immense advance on the first edition of 1891, and is indispensable to every worker in this branch of entomology; it is not perfect, it is impossible for such a catalogue ever to be free from errors; I have already mentioned one case in which two distinct species have been confused under one specific name, but at any rate it is the high-water mark of our present knowledge of the coleoptera of Europe.

Three valuable local lists have also appeared—Commander Walker's "Oxford List," which gives the names of all the species taken within a seven-mile radius of the centre of Oxford from 1819-1907; there are 1399 in the total, with notes as to their habits, etc. The list has been carefully compiled, and the quality of the work is what we always expect from its indefatigable author; he promises soon to issue a supplement. In connection with the "Victoria History of the Counties of England," two lists have been published; in the Yorkshire volume, there is a list of 1707 species found in the county of broad acres, a total which is bound to be much increased later on, the list is due to Mr. E. S. Bayford and Mr. M. L. Thomson; and the Devonshire volume contains a list of the coleoptera of the county prepared by Mr. J. H. Keys.

In my "Retrospect for 1906" (*Ent. Rec.*, vol. xix., p. 33), I briefly alluded to Mr. F. Balfour-Browne's second paper on the aquatic coleoptera and their surroundings in the Norfolk Broads (*Transactions of the Norfolk and Norwich Naturalists' Society*, vol. viii., p. 290). I have now had the opportunity of studying this paper, which is as thorough a piece of work as that described in the first paper. The author has modified the method adopted in his first paper for mapping out the results of his collections, and the curves in this paper supersede those of the previous one. In regard to the question as to whether the *Hydradeephaga* are double-brooded, Mr. Balfour-Browne is now inclined to think that the conclusions he came to as the result of the investigations reported in his first paper are wrong, and that all the evidence he has now been able to gather with regard to egg-laying, larvæ, and immature imagines points to one cycle only in each year. In regard to the problem he discusses as to what becomes of water-beetles when the home-pond, or dyke, dries up, an observation of my own may be of value. I was collecting in the marshes below Gravesend in September, 1899, after a very hot and dry summer, and came across a perfectly dried-up pond, the bottom of which was covered with dry, caked, and cracked, black mud; on pulling up some of these dry-looking slabs, I found the underside was moist, and lying between them and the still moist lower mud were hundreds of

specimens of *Agabus conspersus*, Marsh., which were evidently aestivating so to speak till the autumn rains, which came on a few days later, should again fill up their pond with water. I would advise every coleopterist to obtain a copy of this paper, and to read first of all, and remember always, the last two paragraphs; the reproach levelled at our heads is thoroughly deserved, and, until there is a radical change in the method of work of the majority of entomologists, it will remain true that "entomology is still chiefly a playground for the collector."

My own chief contribution to the literature of the subject during 1907, was my vice-presidential address to the Lancashire and Cheshire Entomological Society; it has appeared in their "Annual Report and Proceedings." Its main feature was a series of suggestions as to the methods by which the work of such local societies might be made more fruitful and more truly scientific.

I close my Retrospect with the feeling that 1907 has seen a fair amount of really good work, but I must repeat my annual grumble that the output is by no means commensurate with what we can reasonably expect; if those who are devoting themselves to this branch of entomological science would remember that they will do little that will last until they train themselves by study and by patient labour to become biologists in the true sense of the word, we should soon see a wonderful increase in that class of papers for which I may take as types those due to Mr. Crawshay and to Mr. Balfour-Browne.

Notes on Lepidoptera During the Season 1907.

By PERCY C. REID, F.E.S.

My work for the year 1907 commenced on March 1st (except for a few larvæ of *Ægeria tipuliformis*, which I collected in my garden in February), when I ran down to Dawlish for a few days. *Larentia multistrigaria* was fairly common and in excellent condition on The Warren, and I secured two larvæ of *Stilbia anomala* and a quantity of those of *Epunda lichenea*, the imagines appearing during the last fortnight of September. From the *E. lichenea* I subsequently obtained ova and the young larvæ are now feeding. On March 10th some larvæ of *Macrothylacia rubi* and *Phragmatobia fuliginosa* obtained during the previous autumn in Rossshire, began to move after hybernation. On March 14th I went for a week into Kent in search of mines of *Ægeria andrenaeformis*, and succeeded well, as larvæ were not rare in *Viburnum lantana*, though hard to find until one got used to the search; altogether I bred just two dozen from three dozen mines. They emerged between June 26th and July 19th; I merely stood the mined stems in a cage in a little earth which I occasionally moistened. The imagines all appeared in the morning, usually about eight to nine o'clock. On my return home *Phigalia pedaria* and *Asphalia flavicornis* were emerging. A visit to the woods in this neighbourhood yielded plenty of larvæ of *Ægeria cynipiformis*, and, to a less extent, *Æ. culiciformis*, while those of *Trochilium crabroniforme* were to be found in the tallows. *Nyssia hispidaria* appeared at the end of the month, and a single female *N. lapponaria*, the sole representative of a brood of Kinloch-Rannoch larvæ. I find this a most difficult insect to breed, most of the pupæ going over year after year and eventually drying up. At the

commencement of April I searched round the poplars here for *Trochilium apiforme*. Old mines were in abundance, but larvæ were hard to get without injury, and apparently by no means plentiful. In the end I secured half-a-dozen, but of these only one emerged safely. During the first week of April I found *Egeria culiciformis* was beginning to pupate, an exceptionally early date. A friend having given me an Essex locality for *Egeria sphegiformis*, I paid a visit there and secured, as I hoped, half-a-dozen larvæ, but of these only two proved later on to contain mature larvæ, while two were immature and have continued feeding through the summer, and the others were old. On April 17th, *Hemerophila abruptaria* commenced to appear in the breeding-cages, and continued for a considerable time; and a search for *Egeria formiciformis* in a local osier-bed resulted in a few mines, but of these nearly all produced ichneumons, only one imago and one *Trochilium crabroniforme* emerging successfully. I found that the larvæ of *Egeria formiciformis* apparently feed on only one species of osier, and, as that particular species is being replaced by other more valuable sorts, the prospect of my filling my row is not over bright. On April 25th, *Aleucis pictaria*, *Eupithecia pumilata* and *Selenia illunaria* appeared, and I bred *Eupithecia albipunctata* on May 1st. I see that I have a note, on May 6th, of a pairing of *Hemerophila abruptaria*, after they had been together for 72 hours. It is strange how insects vary in this respect; some species pair immediately on the emergence of the female, others, as in this case, go for days before pairing takes place. During the second week of May I was again in Kent. A search for larvæ of *Egeria sphegiformis* was fruitless, but I found one old mine which proved that the insect existed in the locality, and I must try there again. My trip was not, however, altogether a waste of time for I secured plenty of larvæ of *Eupithecia debiliata* in a wood where bilberry was plentiful, and these emerged very satisfactorily later on. With them were larvæ of *Hypsipetes elutata* and *Boarmia repandata* on the bilberry. Two or three days later *Eupithecia coronata* commenced to emerge from larvæ beaten the previous August from hawthorn and blackthorn. At Whitsuntide I went north to Ross-shire where I spent a week. I took a quantity of pupæ with me and from these *Mimas tiliae*, *Hypsipetes elutata* and *Lomaspilis marginata* appeared during the next few days. Of native insects I found *Eupithecia satyrata*, *Cidaria suffumata*, *Ematurga piniaria*, *E. atomaria*, *Cidaria corylata* with some very handsome aberrations, and *Hypsipetes impluviata* was fairly common. At the end of the month, I moved to Kinloch-Rannoch, where I spent nearly three weeks, very successfully so far as larvæ were concerned, but the weather was unfavourable for perfect insects. *Egeria scoliaeformis* was just pupating, and with hard work I secured a fair bag. A day on the hilltops gave me a dozen and a half *Psodos trepidaria* pupæ, but no *Pachnobia alpina* were found. At the level of the Loch, larvæ of *Plusia interrogationis*, *Fidonia pinetaria*, *Larentia didymata*, *Odontopera bidentata*, *Oporabia jiliogrammaria*, and *O. dilutata* were common in their respective localities. I found the *Oporabia* larvæ on heather, birch, and alder. Those from heather emerged from the middle of August till the middle of September, while the birch-feeding ones emerged through September till the middle of October. They form a very varied series, and I am by no means sure that I can correctly separate the

two species. Unfortunately none of the alder larvæ emerged. Imagines of *Lobophora hexapterata* were common during early June, and I secured two *Cynatophora* or from the same aspen trees. *Cidaria suffumata* were getting worn, while *C. corylata*, although plentiful further north, in Ross, in May, did not appear at Kinloch till the middle of June. Shortly after my arrival I got three or four *Hadena glauca*. Having failed to attract any to sugar, I cut some bunches of blossom of *Arctostephalos uva-ursi* (bearberry) and took them to a spot where none grew, with the result that I found *H. glauca* readily attracted, but they were then becoming worn. On June 11th, I found a specimen of *Lophopteryx carmelita* at rest on a tree-trunk. Considering the date and the fact that it was a male, it was in fair condition. From larvæ of *Hypsipetes elutata* found on bilberry, I bred some very handsome dark forms. A search for larvæ of *Larentia ruficinctata* unfortunately escaped my memory till June 12th, when I was evidently too late, as I could only find one. When I returned home *Eupithecia pygmaeata* from Wicken pupæ began to emerge, and *Eupithecia debiliata* a week later. Early in July I was breeding *Notodonta chaonia*, *Anticlea sinuata*, and *Heterogenea asella*. I forgot to mention that, on June 20th, I beat several larvæ of *Eupithecia coronata* from hawthorn, which emerged at the beginning of August, and, strangely enough, at the end of that month, I beat others again from the bramble blossom, one of which emerged on September 29th, apparently constituting a third brood. Having obtained leave from a friend to try my luck with sugar on his marshes near the sea-coast, I paid six or seven visits between July 7th and 20th, and succeeded in bagging a dozen fine specimens of *Leucania faricolor*, as well as nice series of *Acidalia emutaria* and *Mamestra abjecta*. I secured the *L. faricolor* partly on sugared bunches of grass and partly on the wing. It was impossible to distinguish them at the time from the other *Leucaniids*, so I boxed all I could, and sorted them by daylight, when there was no difficulty in picking out the specimens of *L. faricolor*. I succeeded in getting a batch of ova of *Acidalia emutaria*, the larvæ from which are now hibernating on knotgrass. A single *Cucullia gnaphalii* emerged on July 19th. The following day I went with a friend to pay a visit to the Deal sandhills. Luckily the weather favoured us and we found insects extremely plentiful, except *Leucania littoralis*, which was scarce. *Acidalia ochrata* was in quantity, while *Agrotis tritici*, *A. nigricans* and *A. vestigialis* (*valligera*) swarmed. Only on our last evening did we box two *Lithosia pygmaeola*, but I think that was entirely because we had failed until then to recognise the insect. Towards the end of July imagines of *Emmelesia unifasciata* emerged freely in my cage, from larvæ taken here last autumn; I bred a very full series and found hardly any inclination for them to "lie over." On August 15th, I found *Larentia olivata* very plentiful at dusk, in Kent, and in very fine condition. I spent the third week of August in Sussex in search of *Cucullia gnaphalii* larvæ and was more successful than I could anticipate, but the larvæ were very small—no larger than they usually are at the commencement of the month. When September came in, I was again in Kent and found larvæ of *Eupithecia pimpinellata* and *E. trisignaria* plentiful, though local, on *Pastinaca sativa*. Broods of *Acronycta myricæ* and *A. menyanthidis* were pupating by the middle of the month, and then *Epunda lichenea* began to emerge and carried on till October.

The eggs of *Cyclopides palaemon* and *C. sylvius* and their Thymelicine affinities (with three plates).

By T. A. CHAPMAN, M.D., F.Z.S., F.E.S.

It may be desirable to begin by saying that the important point of this note is the observation of the Thymelicine affinities of the eggs of *Cyclopides*, i.e., that they have not a circular, but an oval, horizontal outline. Mr. Gillmer sent me four eggs of *C. palaemon* and three of *C. sylvius*, so that the observation is not of an odd egg. On examining these eggs, I soon noted the oval outline of *C. sylvius*, but that of *C. palaemon* escaped me, as it appears to have done previous observers, until, by applying accurate measurements, I found it was little less oval than that of *C. sylvius*. After that I was able to see it under a hand lens. The photograph of the egg of *C. palaemon* ($\times 20$) in Tutt's *Nat. Hist. of Brit. Lepidoptera*, vol. viii., p. 83, pl. i., fig. 6, shows, in measurement, a long diameter of 17mm., a short one of 15mm., a little more than the .9mm. to .8mm. I record, but really the same if one admits a trifling vagueness in the outline in the plate.

On June 15th, 1907, I received from Mr. M. Gillmer eggs of these two species, with a request that I would describe them, as he considered the accepted descriptions were decidedly faulty. The texture of the surface of the egg he especially notes as having been erroneously reported. I have pleasure in doing my best to meet Herr Gillmer's request, as the eggs have unquestionably many points of interest, and as regards that of *C. palaemon*, the descriptions in Tutt's *Nat. Hist. Brit. Lep.*, vol. viii. (*Brit. Butts.*, i.), p. 201, where we may assume all that is known of it has been reported, are, to say the least, so defective as to require supplementing. As there is no finality in such matters, it may not be long before these notes will be found insufficient. Mr. Gillmer says the eggs were laid on June 11th or 12th. The butterflies were caught near Stralsund, in Pomerania, and sent to him alive, and the eggs having been laid whilst the imagines were in his possession, he can answer for the eggs being certainly those of the species named.

The eggs of the two species are much alike in size, form, and colour; in colour I see no difference, both being creamy-tinted, nearly white; in form they differ a little, but it is desirable first to describe what the form is. They both have the oval outline of Thymelicine eggs. This form of egg was first noted by Hellins (Buckler's *Larvae*, vol. i., p. 196), though its peculiar significance was not then understood. Mr. Tutt especially notes it in *Nat. Hist. Brit. Butts.* (1905), p. 91. On this same page is a footnote quoted from me, which is certainly obscure, if not misleading, and I may, by the way, take this opportunity of pointing out what I wished to explain. The micropyle is a fixed and definite point of the egg, we may take it as a starting-point, identical in all eggs. The great mass of lepidopterous eggs divide into two sections.—(1) The more primitive, in which the egg is laid on its side ("flat" eggs), with the micropyle at one end; these eggs, seen from above, are usually oval, and have, in fact, three unequal axes. (2) The more evolved ("upright") is laid on the nadir of the micropyle, and has the micropyle on top. In these the outline, seen from above, is almost invariably circular. Certain Geometrids show how a "flat" egg, in different members of a group, may acquire an upright position and a circular outline in transverse section. The egg has, in fact, except in the most primitive spherical eggs, a strong tendency to have

a non-circular outline in any section through the micropyle, and a circular one in any section transverse to the micropylar axis. The latter tendency has free scope, and almost invariably takes effect in "upright" eggs. At first glance a Thymelicine egg looks like a flat egg, having an oval outline, but we find that it has the micropyle on top, and is, therefore (like those of all other butterflies), an upright egg. Had the micropyle been at the end, it would have been a flat egg, and we should have rejoiced at here finding how the more primitive flat egg was to be found in the lowest family of butterflies. This is, however, not so. Apart from the fact that lower, probably allied, families (*Castnia*, *Cossus*) have "upright" eggs, the egg itself suggests that it has been derived from an ordinary upright egg (with circular outline), and is not at all directly derived from a flat egg. Most probably it is derived from an ordinary upright egg, in response to a necessity of fitting more easily into folds of blades of grass, according to the observation recorded by Hellins.

What I wished to point out in the note referred to is, then, simply this: That an egg may conceivably take any position, with micropyle above, below, or laterally; the micropyle is a fixed point, and cannot be moved to another part of the egg, so that a flat egg with oval outline, *i.e.*, lying on its side, cannot continue to lie on its side, and move the micropyle to the top. The oval outline of an egg with micropyle on top has, therefore, no necessary relationship to one with the micropyle at end.

In order to get a little closer to the subject, I have made various endeavours to get *Adopaea flava* (*linea*) to lay some eggs, but in this I have absolutely failed, in common with Mr. Hellins, although a reference to Hawes, in Tutt's *Brit. Lep.*, viii., p. 108, distinctly suggests,

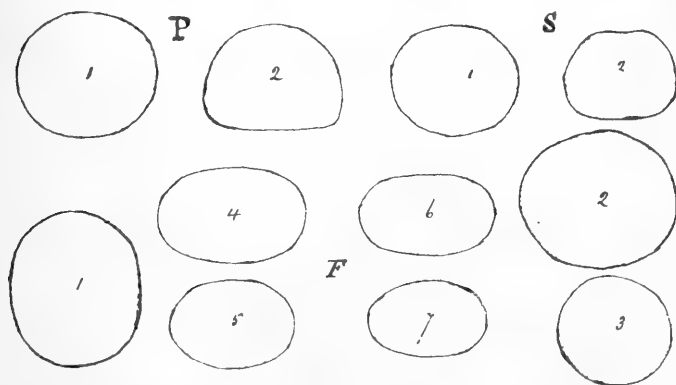


FIG. 1.—P=EGG OF CYCLOPIDES PALAEMON:—1, TOP VIEW; 2, SIDE VIEW. S=EGG OF *C. SILVIUS*:—1, TOP VIEW; 2, SIDE VIEW. F=EGGS OF *ADOPEA FLAVA*:—1, 2, 3, TOP VIEW OF LARGE AND SMALL EGGS; 4, 5, SIDE AND END VIEW OF LARGE EGG; 6, 7, SIDE AND END VIEW OF AVERAGE (OR PERHAPS SLIGHTLY BELOW AVERAGE) EGGS. (ALL $\times 24$.)

however, that the former has done so. I have, therefore, been compelled to obtain the eggs of *A. flava* by dissection of females dying after refusing to lay. This is not wholly satisfactory, but probably leads to no important errors.

I find the egg of *A. flava* is exceedingly variable in size, and besides being oval in transverse section, is not flat beneath, but nearly as rounded as above. My measurements of *A. flava* eggs show: length, 0.65mm.-0.90mm.; width, 0.60mm.-0.72mm.; height, 0.45mm.-0.54mm. Comparing these with Mr. Sich's measurements (*Brit. Lep.*, viii., p. 108), and with Mr. Hellins' statement, no doubt a rough one, that the egg is half as long again as wide, I think we may assume that Mr. Sich's measurements possibly erred somewhat, and mine much more, owing to our method of obtaining the eggs not presenting them, as they occur when laid naturally, after more drying and shrinking has taken place. To bring out these points in comparison with the eggs of *Cyclopides*, I have made rough outlines of the eggs of the three species. See Fig. 1 (preceding page).

To return to *Cyclopides*. The Cyclopidid eggs, as shewn in the diagram above, have the oval outline of Thymelicine eggs so much less pronounced than in *Adopaea*, that it appears hitherto to have escaped notice, but is, when once seen, quite obvious. This fact makes it probable that *Cyclopides* is much more closely related to *Thymelicus* than one gathers from the discussion of the subject in Tutt's *British Lepidoptera*, vol. viii., p. 91. It is, however, quite rational to hold, that this form of egg exists in the two groups independently, although it certainly seems unlikely, considering the very special nature of the egg.

(To be concluded.)

The Conocephalidae.*

By MALCOLM BURR, F.L.S., F.Z.S., F.E.S., etc.

This is a very useful work from the pen of Dr. H. Karny. It is a supplement to Professor J. Redtenbacher's Monograph published in the same pages in 1891. During the sixteen years which have elapsed since the appearance of Professor Redtenbacher's able monograph of the *Conocephalidae*, considerable progress has been made in our knowledge of this family. This progress has been epitomised by Herr Karny of Vienna. This zealous and prolific 'orthopterist' has also characterised and described seventeen new genera and 95 new species, and so this revision is amply justified by abundance of new material.

The family is divided into four tribes: The *Conocephalini*, *Agracini*, *Xiphidiini* and *Litroscelini*.

The tribe *Conocephalini* includes 37 genera, of which four are new, and seventeen new species are described. The typical genus, *Conocephalus*, ceases to have an independent existence, as Redtenbacher's three subdivisions are given names, namely *Neoconocephalus*, *Euconocephalus* and *Homorocoryphus*, but as the latter includes the type species the name cannot stand: *Conocephalus* must prevail, and the subgenera must be genera, as there can be no rank intermediate between genus and species. It is fortunate that this unwieldy genus has been subdivided, for *Neoconocephalus* alone contains no fewer than 78 species, of which nineteen are new; the type is *N. subulatus*, Bol. *Euconocephalus*, formed for *C. acuminata*, Fabr., has five new species, and *Homorocoryphus*, or as we prefer *Conocephalus*, has 43 species, by which twelve are described for the first time; our old friend *Conocephalus mandibularis*,

* "Revisio Conocephalarum," by H. Karny (*Abhandlungen der k.k. zool.-bot. Gesellschaft in Wien.*, with 21 Textfigures, Jena, 1907.

Charp., is referred to as *Homorocoryphus nitidulus*, Scop. The prior right of Scopoli's specific name is now generally admitted. The author remarks that four species of *Conocephalus*, described from Tonkin by Kransze are insufficiently described and so must be neglected as their true position cannot be determined. These species are *C. tetrus*, *C. striatus*, *C. subtilis* and *C. ultimus*.

The *Agracini* are a tribe of 51 genera, of which eleven are new, with 23 new species. The *Xiphidiini* have fewer genera but numerous species. *Orchelimum* has 23 species of which all are North American except one African and Australian form. *Xiphidium* has 80 species from all parts of the world; six of these are new. The *Litroscelini* are a small group of twelve genera, two of which are new, but there are thirteen new species. The *Agracini* and the *Litroscelini* occur only in tropical regions of both worlds. The *Conocephalini* and *Xiphidiini* are abundantly represented in both hemispheres. In Europe, this interesting family is poorly represented by *Conocephalus nitidulus*, Scop., and a few species of *Xiphidium*. The latter is represented in Britain by the single species of *X. dorsale*, Lat., which occurs in a few marshes in England. The macropterous form discovered in Essex by Harwood has not yet, to our knowledge, been recorded elsewhere.

The revision is written entirely in Latin; synoptical tables are given only where real additions to Redtenbacher's tables are necessary. A general list of works quoted is given at the end and a special list for each family is also added, an arrangement which is not without its advantages. The table of genera of each tribe is followed by a "Conspectus Geographicus" which gives a clear view of the geographical distribution.

NOTES ON COLLECTING, Etc.

LEPIDOPTEROLOGICAL NOTES ON THE SEASON 1907 AT BURNLEY.—No collecting was done before the beginning of April, when a search was made for spring larvæ but only those of *Noctua festiva* and *Xylophasia rurea* were at all plentiful, and from the latter a nice series was bred including several *ab. alopecurus**, which emerged the last week in June. *Larentia multistri-garia* was very scarce and no dark forms were observed. On May 11th, a fine male *Dicranura vinula* was brought me; this was very early for this district. On the 18th, larvæ of *Abraas grossulariata* were observed in numbers, but were only about half-grown. The 25th was the first time the moors were visited, but the cold winds had kept everything back, and little was noted; a few *Cidaria suffumata* were beaten from heather, *Taeniocampa rubricosa* and *Hadena glauca* were at rest on the rocks, while only one or two *Ematurga atomaria* were flying, but one of these, taken by my friend Mr. A. E. Wright, was of the dark unicolorous form. Further visits on June 8th and 22nd, produced nothing further except *Coremia ferrugata*, on each occasion, however, larvæ of *Larentia caesiata* were plentiful with an occasional

* We wonder if our correspondent really does breed the *ab. alopecurus*, Esp. Seventeen years ago, we wrote: "Very few British specimens, we believe, will answer to Esper's description of *alopecurus*." Guenée says "the exterior outline of the reniform yellowish," evidently not applicable at all to Esper's insect. Newman's description shows equally that he had something other than Esper's form before him. It would be really interesting to know what percentage of real *alopecurus*, Esp., occurs, i.e., agreeing with the description of Esper's figure given in *The British Noctuae and their Varieties*, i., p. 80.—ED.

Oporabia filigrammaria, and it was observed that, while larvæ of *L. caesiata* were nearly always found on the young growth of the heather, those of *O. filigrammaria* seemed to prefer the older twigs. *Hypsipetes impluviata* were late in emerging; not till the 14th were they at all plentiful, while on the 21st they were still numerous but getting worn; on the same dates *H. elutata* larvæ were numerous and from them a nice series of imagines emerged early in August. During the whole of the month *Habrostola tripartita*, taken as larvæ in the preceding autumn, emerged occasionally, and among them several of the dark form, ab. *urticeæ*.† Early in July, on the moors, both *Hepialus relleda* at dusk and *Larentia caesiata* on the rocks were abundant, much more so than usual, and in fine condition, but the best *L. caesiata* was one which was bred, being very nearly black. Mr. Wright took one *Leiocampa dictaca* at light, and several *Alucita pentadactyla* and *Boarmia rhomboidaria* ab. *perfumaria* in his garden, all three species being new to our local list. On August 1st a specimen of *Platyptilia gonodactyla* was taken and a second one on September 11th. All August was cool and very windy and practically nothing was done. September was much better, but all moths whose larvæ fed up in the spring were much later than usual; *Polia chi*, very few till the 14th, while good ones were seen on the 28th; *Celaena haworthii* was scarce, most being seen about the 21st. *Charaæa graminis* were about as usual, but no *Nonagria fulva* till the 28th; *Cidaria populata* and *C. testata* were more numerous than usual, especially on the 14th. All these were taken on the moors, and on our last visit on September 28th, among the late-comers, were *Noctua festiva* and *Larentia caesiata*. *O. filigrammaria* emerged from September 1st to the 19th, and there were several nice dark forms. Mr. Wright took several *Dasypolia templi* at light early in October, also one or two *Hydroecia micacea*, but the last Noctuids seen were one *Xylophasia polyodon* on the 11th and another on the 23rd.—W. G. CLUTTEN, 132, Coal Clough Lane, Burnley. December 10th, 1907.

HELLINSIA CARPHODACTYLA AT SANDOWN.—Following hard on my record of *Leucania unipuncta* and *Celaena haworthii* for one of the Isle of Wight "associates," comes the welcome, though not altogether unexpected, discovery that another of them has added *Hellinsia carphodactyla* to the Sandown list. Among some moths sent up for determination by Mr. H. F. Poole, of Shanklin, was a good specimen of this "plume" taken on the chalk near Sandown on June 16th, 1907. I myself took a small, wasted specimen not far from there on August 28th, 1906, which I supposed to be an *Adaina microdactyla* that had lost its way (there is no *Eupatorium* near, but plenty of *Conyza*), and, although my suspicions were aroused when *H. carphodactyla* was recorded as British, I had neglected to submit it to Dr. Chapman, inasmuch as it was no larger than normal *A. microdactyla*. Mr. Poole's specimen is full-sized and typical, and sets the matter at rest. He believes that he saw others on the same occasion, but only took this one as a sample, as he is busy recording the lepidoptera of the Island.—LOUIS B. PROUT, F.E.S., 246, Richmond Road, Dalston, N.E. December 2nd, 1907.

† This is a most interesting record. The unicolorous form of this species has remained, so far as our knowledge goes, as rare as it was when we first noted it as a British form (*The British Noctuae and their Varieties*, iv., p. 17).—ED.

SEARCHING FOR NESTS OF *Formica rufa*.—Hearing that there were nests of *Formica rufa* in a wood near here this autumn, I met the keeper, and we had no difficulty in finding one at the edge of a path. Other nests were more difficult to find as they were placed in very thick undergrowth. The wood had been cleared two years before and small fir-trees had been planted. It had not, however, been "grubbed" and the stumps of the trees and briars were growing freely. It seemed rather a hopeless place to look for nests, but the keeper pointed out to me that when a nest was placed in thick undergrowth, the latter was evidently well nourished, as it was taller than the surrounding herbage and of a darker green. After this I had no difficulty in locating nests from some yards' distance, although they were always quite hidden from view; but sometimes they proved to be uninhabited.—NORMAN H. JOY, Bradfield. December 4th, 1907.

LATE APPEARANCES OF LEPIDOPTERA IN 1907.—With reference to Mr. Raleigh S. Smallman's note (*Ent. Rec.*, xix., p. 263) in which he states that he noticed several specimens of *Coenonympha pamphilus*, *Epinephile janira* and *Pieris rapae* on the wing, near Jevington, on October 5th last, it may be of interest to mention that, on the previous day, whilst recruiting my health in a very warm spot on the South Devon coast, I captured or observed five *Epinephile janira* (all are believed to have been females—four certainly were so—and one or two were in really good condition), one *Rumicia phlaeas*, one *Polyommatus icarus* (male), two or three *Pieris rapae*, and, I believe, one *P. brassicae*, which, however, was not near enough for certain identification. These late appearances are especially remarkable in view of the locality being so exceptionally warm. In proof of the abnormal scarcity of autumn butterflies in the disappointing season now fast drawing to a close, I may add that the only other butterflies seen, during the two hours and a half of bright hot sunshine on the date in question, were one *Pyrameis cardui*, one or two *P. atalanta*, and two or three *Aglais urticae*.—EUSTACE R. BANKES, M.A., F.E.S., Norden, Corfe Castle. November 22nd, 1907.

NOTE ON BRITISH RECORDS OF *SIREX JUVENCUS*.—Referring to Mr. Joseph Anderson's note (*Ent. Rec.*, xix., p. 265) in which he records the occurrence of "*Sirex juvencus*" at Chichester, may I ask whether he is quite certain that the species in question is the true *Sirex juvencus*, F.? I have no wish whatever to be unduly sceptical, but, remembering that, in *Ent. Mo. Mag.*, ser. 2, xv., p. 34 (1904), the Rev. F. D. Morice wrote as follows: "*Specimens of noctilis*, F., are, I believe, constantly recorded in this country under the name *juvencus*, F., and I have probably named them so for correspondents myself. But if the true *juvencus* occurs at all in Britain, it must be very rare. I have it from Switzerland, but have never seen a British specimen which I can confidently refer to it," one feels obliged to mistrust all British records of *juvencus* which do not rest upon the authority of an expert who is well acquainted with both *juvencus* and *noctilis*.—EUSTACE R. BANKES, M.A., F.E.S., Norden, Corfe Castle. November 23rd, 1907.

LARVÆ OF LEPIDOPTERA FROM BELLINGHAM, NORTH TYNE. — An account of a ramble in this district may be interesting, as records seem scarce from this locality. The occasion was a field excursion of the Newcastle and Durham Natural History Society, made on June 26th. Journeying from Newcastle, one had ample time to read in the train accounts of the arctic summer and feel thankful that, so far, this

morning promised fair, although, before we reached the end of our journey, our hopes were disappointed and we emerged from the station in a fine driving rain and high wind. The first larva found was that of *Nudaria mundana*, common on the stone-walls by the roadside. Beating for larvæ was very difficult on account of the high wind, but those of *Cheimatobia brumata* were very common, whilst equally common on the birch-trees which skirted a small stream, running over the moorland, were those of *C. boreata*: the larvæ of this latter species were knocked down in plenty. Larvæ of the following species were also taken chiefly from whitethorn and blackthorn—*Hybernia rupicaprariva*, *H. progemmaria* and *H. defoliaria*, *Phigalia pedaria* (*pilosaria*), *Crocallis elinguaris*, *Poecilocampa populi*, *Diloba caeruleocephala* and *Miselia oxyacanthæ*; it may be noted with regard to the latter, that a grey or lichen-coloured form of larva is very common here. Larvæ of *Polia chi* were taken off sawallow, and odd larvæ of *Oporabia filigrammaria*, *Larentia didymata*, *Scopelosoma satellitia*, *Cleoceris riminalis* and *Agriopsis aprilina*. A few larvæ of *Asphalia flavicornis* were secured, while a careful search on the heather for those of *Trichiura crataegi*, only yielded four larvæ; those of *Lasiocampa quercus* were also noted, but they were small in size. The day was so cold and wet that one could not hope to meet with any imagines. Odd specimens of the following species were noticed, however, viz., *Coremia ferrugata*, *Anarta myrtilli*, *Eupithecia nanata* and *Cilix spinula*.—G. NICHOLSON, 26, Lancaster Street, Newcastle. November 26th, 1907.

VARIATION.

REMARKABLE CREAM-COLOURED ABERRATION OF AGRIADES CORYDON.—The fore- and hindwings are of a very delicate cream-colour, shading almost to white, with a faint bluish sheen, and having the fringes a pale yellow-ochre inclining to brown. The thorax is pale blue; abdomen and head the same colour as the wings, the neck being pale yellow-ochre; the eyes are black; the antennæ white-tipped with reddish-black on the underside. The underside of the butterfly is very much the same as the upper, though duller; and also at the base of the wing there is a slight tinge of yellow-ochre and a tiny indistinct sooty mark on each hindwing. This butterfly was taken at Freshwater, Isle of Wight, about the second week in August, 1907.—W. S. PEARCE, St. Mogue's, Romsey, Hampshire. December 14th, 1907. [Mr. Pearce has sent us a coloured drawing of this most remarkable aberration, and has written the above description at our request.—ED.]

ABERRATION OF EUPITHECIA ABSINTHIATA.—Last September I beat a good many "pug" larvæ from ragwort, these have been emerging all the summer, the first on May 14th, the last on September 11th. A few of them were *E. centaureata*, and all the remainder *E. absinthiata*, one of the latter being a dark unicolorous aberration, nearly black.—W. G. CLUTTEN, 132, Coal Clough Lane, Burnley. December 10th, 1907.

CURRENT NOTES.

The Editor appears to be happily placed in being so specially remembered at Christmastide by our readers. Of the many specially interesting tokens received from brother entomologists, one may specially note the delightful poem, "Christmas, MDCCCXVII," by Mr. Selwyn Image; Mr. Malcolm Burr's beautiful little lepidopteron!

"*Djaydubblew tuttisimus*, nov. sp. Hab. Blackheath," forwarded in most approved entomological style. Mr. F. N. Pierce's "Entomological diablo," delightfully suggestive, the larva wonderingly waiting with a net to see what he may finally come to, whilst the devil spins the pupa in the air; excellent photos taken during the summer holidays by Dr. Chapman and others, besides endless beautiful cards. Time alone is wanting to return individual thanks.

The best piece of "natural history" work done for many a long day among the lepidoptera of North America, is Cook's "Studies of the genus *Incisalia*," a Callophryid genus of hairstreaks allied to our *Callophrys rubi*. Now that the foodplant of *Incisalia polios* has been determined as *Arctostaphylos uva-ursi*, and eggs, larvæ, and pupæ have been in due course obtained, Mr. Cook deserves the congratulations of all those lepidopterists, who are naturalists in the true sense, for his determined attack on this little-known group. We particularly owe Mr. Cook our thanks, being entirely indebted to him for most of the facts, connected with this group, which we have published in Chapter x of our second volume of *The Natural History of the British Butterflies*. We still await successors to Edwards and Scudder, who were naturalists before all things, and systematists only as an after-thought, even if they were the best that America produced in that direction also.

We have received an apparently carefully compiled and interesting list of the "Lepidoptera and other Insects observed in the Parish of Mortehoe, N. Devon," by Dr. G. Longstaff. It is most unfortunate that Dr. Longstaff has chosen to follow the impracticable and still-born "Meyrick list," and offers us such items as *Chrysophanus astrarche* and *Chrysophanus phlaeas*. We are interested in these species, and dislike greatly seeing such heterogeneous elements forced into so unnatural an union.

It is with the greatest regret that we hear, just as we are going to press, of the death of one of our sub-editors, Mr. A. J. Chitty. A full notice will appear in our next issue.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—November 20th, 1907.—RARE COLEOPTERA: *Tropideres sepicola*, F., taken in the New Forest near Matley Bog, July 7th, 1904; *Oxytaenus variolosus*, Dufs., from Darenth Wood, March 2nd, 1903; and *Apion annulipes*, Wenck., from Darenth Wood, August 27th, 1905, Mr. H. St. J. Donisthorpe for Mr. W. West of Greenwich. MICROMORPHISM IN A BEETLE: A remarkably small specimen of *Meloë proscarabæus* with an example of the normal size, Mr. Willoughby Gardner. FORMS OF ARASCHNIA LEVANA: Examples of *Araschnia levana* var. *prorsa* and intermediates, bred from larvæ found in the department of Aisne, France, in June last. Out of 176 individuals that emerged from the pupal stage, 109 were var. *prorsa*—65 ♂s and 44 ♀s; 4 approached nearly to ab. *porima*—2 ♂s and 2 ♀s; 29 were intermediate between *prorsa* and *porima*—23 ♂s and 6 ♀s; all emerging in a room of average temperature at Croydon, July 30th-27th. The forms *porima* and intermediates, he thought, were attributable to the cold summer. The remainder of the specimens came from pupæ which, as soon as formed, were removed to a refrigerator and kept there for fifteen days, being after-

wards subjected to the same treatment as the other lot of pupæ. These emerged August 8th-15th and showed one var. *prorsa*; 16 between *porina* and *prorsa*—6 ♂s and 10 ♀s; 2 ab. *porina*, both ♂s; 16 intermediates between *prorsa* and the type *levana*—12 ♂s and 4 ♀s, of which several approached very nearly to the typical brood—*levana*, Mr. W. G. Sheldon. Dr. T. A. Chapman also showed specimens of *Araschnia levana*, type, bred 1907, to give a fuller view of this form in assistance to Mr. Sheldon's report. He said the palest specimens were probably the result of leaving the pupæ at a temperature at or below 54° till the butterflies were nearly ready for emergence; but, on the whole, they are probably not far from normal *levana*, the darker being chiefly ♂, the paler ♀.

OVIPOSITION OF ARASCHNIA LEVANA: Mr. Sheldon also showed strings of the ova *in situ* on nettle these being base to apex, and, in position, resembling that sometimes said to be characteristic of those of *Polygonia c-album*, although the latter is said to lay singly by Bird (*Ent. Rec.*, xix., p. 126).

EXOTIC COCKROACH FROM SOUTH KENSINGTON: Mr. G. Arrow exhibited a specimen of a handsome exotic cockroach (*Dorylaea rhombifolia*) found alive in the Natural History Museum. He remarked that he had seen this species there several years ago but had not captured it. The present specimen was found in a different part of the building by Mr. T. Sherrin, on Nov. 16th. It is an apterous species inhabiting China, India, Madagascar, S. Africa, etc., and has also been recorded from Tropical America.

TEMPERATURE EXPERIMENTS ON BUTTERFLIES: Lieut.-Colonel N. Manders exhibited a collection of some 200 specimens of tropical butterflies belonging to the genera *Melanitis*, *Mycalesis*, *Atilia*, *Papilio* and *Catopsilia*, which had been subjected to abnormal degrees of temperature mostly in the pupal stage. The object of the experiments was to ascertain the effect of climate on the colours of tropical butterflies. He said that with the exception of Mr. Marshall's experiments on certain S. African butterflies literally nothing had been done as far as he knew in the laboratory in relation to this question. He himself held the view tentatively, that certain cases believed to be examples of Müllerian mimicry would be proved eventually to be cases of climatic resemblances, produced in insects of different genera or even families by climate acting on organisms similarly constituted, and so responding in a similar manner to the same stimulus. While readily admitting that the specimens in the exhibit were too few for definite conclusions, they showed in *MELANITIS* and *MYCALESIS* that there was good evidence for the belief that in two species—*leda* and *narcissus*—of these genera the seasonal phases are induced by cold and heat, and not by dryness and moisture. In *ATELLA PHALANTA* there was reason for believing that the presence of the violet or purple on the under-surface was due to deprivation of light during the rearing of the insect from the egg to the imago. In *CATOPSILIA FLORELLA* any abnormal temperature produced an increased number of yellow females (*thadia*), no typical white female, but an abundance of intermediates, which were absent so far as his experience went under normal conditions in Mauritius, though common enough in India and Africa. The males remained unchanged. In *PAPILIO DEMODOCUS* there was an increase of red round the costal ocellus on the upperside of the hind-wing and a very distinct general ruddiness on the under-surface of the hind-wing produced by cold.

December 4th, 1907. **VARIATION IN ANTHROCERA TRIFOLII:** Examples of *Anthrocera trifolii*, collected on the same ground in Sussex, and

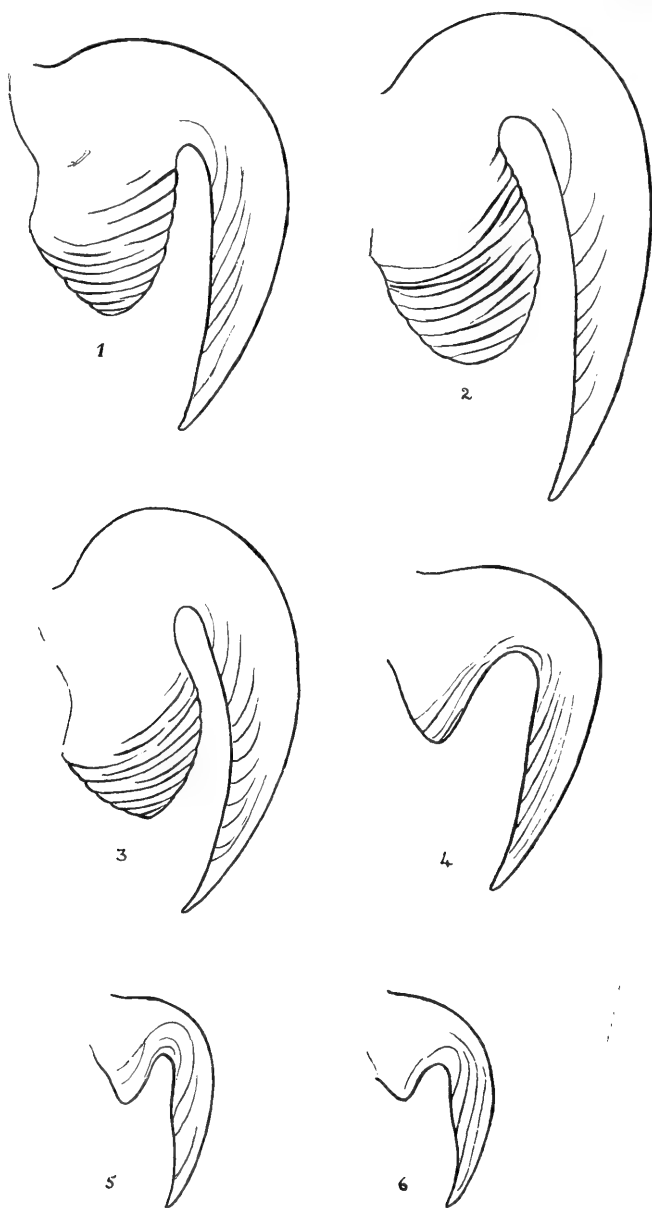
showing a wide range of variation, including three fine melanic forms = *ab. obscura*, Tutt, and several examples, apparently of *ANTHROCERA HIPPOCREPIDIS*, Stphs., showing six spots on the upper-wings. The exhibitor remarked that these latter were bred by him from cocoons found on the ground, and not as in the case of the others from those taken on ling, &c.—Dr. G. C. Hodgson. LOCUST AND PREY: The President showed two photographs of an African locust which had apparently caught a mouse and was preying upon it. The specimen was found in the Congo State. REST ATTITUDE OF *HYRIA AURORARIA*: "During the past summer I had the opportunity of studying the habits of this species in the field near Glastonbury, Somersetshire. I first met with it on July 2nd, and after a rainy interval saw it again on July 10th, 11th and 12th. The moth frequented a small patch of ground about 80 yards square, covered with heath and ling, intermingled with bog-myrtle, alder-bushes, and birch-trees. The insect was on the wing in bright sunlight from 10.30 a.m. to 1.30 p.m. The rest-attitude was first observed on July 10th, when following a moth that was flying about four or five feet from the ground. I saw it settle upon the ling a little ahead of me and become invisible. However, on closer inspection I found it had alighted on a thin stem of ling, with the underside of its outspread wings uppermost. When disturbed it again took a short flight of a few yards, and settled in exactly the same manner. This happened during four successive flights of this one insect; and for the rest of that morning and the following days I was interested to notice that all the others, which I saw settle, invariably did so in this attitude. The interpretation is not far to seek when a comparison is made between the colouring of the upper- and undersides. In the former the bright purple and rich golden markings at once attract the eye and render this little Geometrid a conspicuous object. The under-surface, on the other hand, possesses a perfect cryptic colouring of dark dull purple, combined with a tawny yellow-bistre. It should be noted that, on no occasion, was the flower itself selected as a resting-place, but always the leaf or stem, the dull colour of which, combined with the dark shadows in the interior of the plant, formed a background harmonizing in a remarkable manner with the exposed surface of the insect"—Mr. J. C. Moulton.

SOUTH LONDON ENTOMOLOGICAL SOCIETY.—November 25th, 1907.—ANNUAL EXHIBITION OF VARIETIES, ETC.—*HYPSIPETES SORDIDATA*: A very varied bred series from Surrey localities; *COSMOTRICHE POTATORIA*, two males of the pale female coloration captured at Wicken, Mr. E. C. Goulton. *ODONTOFERA BIDENTATA*, bred from black Yorkshire parents, from dark Yorkshire parents, and from a very light Wisley female, with numerous collected specimens from many localities for comparison; *PIERIS NAPI*, four broods, bred from females from the Klein Scheidegg Pass, Switzerland—Messrs. Harrison and Main. *GRAPTA C-ALBUM*, a bred series from ova laid by a female taken by Mr. Barraud in the Wye Valley, with notes on the variation, which included var. *hutchinsonii*. *DIPTERYGIA SCABRUSCULA*, a series taken in his own garden at Reigate—Mr. Tonge. *ABRAXAS SYLVATA* ABERRATIONS, including a broad, dark-banded form, a smoky form almost devoid of markings, forms approaching var. *pantaria*, and one in which the ochreous colour was entirely absent—Mr. Scollick. *COLEOPHORA ONOSMELLA* and *C. BICOLORSELLA*, from Surrey and Kent localities—Mr. Turner. *MELLINIA OCELLARIS*, a short series, captured

in Surrey on sugared leaves of black poplar—Mr. Pratt. *ÆGERIA ANDRENÆFORMIS*, bred from collected pupæ, with its ichneumon *MENISCUS BILINEATUS*—Mr. Edelsten. The rare grasshopper *CHELI-DOPTERA RÖSELI*, from Herne Bay—Messrs. F. and H. Campion. *MELITÆA AURINIA*, bred from Cumberland, much under-sized and darker than usual; *MELAMPIAS EPIPHRON*, three specimens of a second-brood, bred from ova laid by a Honister female; the remaining larvæ were hibernating—Mr. J. Alderson. *ARGYNNIS ADIPPE* and *ANTICLEA SINUATA*, from Arundel—Mr. Garrett. *EPINEPHELE IANIRA*, male, measuring only 38mm.; a pale, ochreous-brown female specimen of the same species; a male with numerous pale ochreous blotches and white fringes; *EUBOLIA PLUMBARIA*, with dark purplish slate-coloured fore-wings and ochreous-edged transverse lines, all from Devonshire—Mr. South for Mr. Pope of Exeter. *EPINEPHELE TITHONUS*, a specimen with the usual fulvous markings, but with the marginal area whitish instead of dark brown, from Salisbury—Mr. South for Mr. Haynes. *MELANIPPE FLUCTUATA*, with the transverse band reduced to a mere speck (ab. *costovata*); *BOARMIA ROBORARIA*, a dark suffused specimen; *ABRAXAS GROSSULARIATA*, specimen with yellow shaded ground—Mr. R. Adkin. *APORIA CRATÆGI*, *TAPINOSTOLA MORRISII* (*BONDII*), *BRYOPHILA MURALIS* (*GLANDIFERA*) and *ÆGERIA CHRYSIDIFORMIS*, from East Kent—Mr. Schoon. *CROCALLIS ELINGUARIA*, a gynandromorphous specimen from Manor Park—Mr. Willsdon.

CITY OF LONDON ENTOMOLOGICAL SOCIETY.—December 3rd, 1907.—

EXHIBITS.—*URBICOLA COMMA*, from Surrey, including a male with cream ground-colour, and another male with the underside as dark as in the normal female, Dr. G. G. C. Hodgson. *DICRANURA BICUSPIS*, three cocoons, containing living pupæ, found on birch-trunks in Tilgate Forest, Mr. L. W. Newman. OFFICERS FOR THE YEAR 1908: *President*: Mr. A. W. Mera. *Vice-presidents*: Dr. T. A. Chapman, Messrs. J. A. Clark, F. J. Hanbury, and L. B. Prout. *Treasurer*: Mr. P. H. Tautz. *Librarians*: Messrs. G. H. Heath and V. E. Shaw. *Curators*: Messrs. G. G. C. Hodgson and A. J. Willsdon. *Secretaries*: Messrs. S. J. Bell and P. H. L. Grosvenor. *Members of the Council*: Rev. C. R. N. Burrows, Messrs. H. M. Edelsten, C. Harris, J. Riches, and A. Sich. December 17th, 1907.—EXHIBITS.—*AGLAIS URTICÆ*, from North Lapland, larvæ. The specimens were slightly smaller, darker, and brighter than normal British specimens, and the brood included some examples of ab. *polaris*, said to be common in those latitudes, Dr. T. A. Chapman. LEPIDOPTERA FROM EAST ABERDEEN, 1907, including very dark *XYLOPHASIA POLYODON* and *NOCTUA XANTHOGRAPHIA*, a red form of *NOCTUA NEGLECTA*, dingy yellow-brown form of *CROCALLIS ELINGUARIA*, and a single specimen of *AGRIOPIS APRILINA*, with the usual bright pea-green ground-colour replaced by pale green, Mr. E. A. Cockayne. *AGLAIS URTICÆ*, from Aberdeen, with a slight trace of a third spot above the two usual black spots on forewings. Also a specimen from Surrey, with these spots almost obsolete, Dr. G. G. C. Hodgson. *ANTHROCERA PURPURALIS* (*MINOS*) and *A. FILIPENDULÆ* from North Argyle, and a six-spotted *ANTHROCERA* with fluffy body, from the same district, Mr. L. W. Newman. *AGLAIS URTICÆ*, with pale yellowish ground-colour, Dr. H. C. Phillips. *AGLAIS URTICÆ* ab. *ATREBATENSIS*, Bdv., Bexley, August, 1905, also from the same district specimens of the same species, with the upper of the two central spots on the forewing almost obsolete, and the lower much smaller than usual.



FRONT CLAW OF ANTERIOR TARSUS OF BRITISH SPECIES OF PHILYDRUS.

A



B



C



D



On the British Species of the genus *Philydrus*, Solier (with plate).

By FRANK BALFOUR-BROWNE, M.A. (Oxon.), F.R.S.E., F.Z.S.

The genus *Philydrus* or *Philhydrus*, is represented in Britain by six species, which are described by both Fowler and Ganglbauer as divisible into two groups, *testaceus*, F., *maritimus*, Thoms., *nigricans*, Zett., and *melanocephalus*, Ol., belonging to the one group, the subgenus *Philydrus*, s. str.; *minutus*, F., and *coarctatus*, Gredl., to the other, the subgenus *Methydrus*, Rey or *Agraphilydrus*, Kew.

I have recently been critically examining these six species, and the following notes are the outcome of this examination, written partly because the characters for separating the species as given by Fowler are to some extent unreliable, and partly because it appears to me that the position of the species *nigricans*, Zett., in the same subgenus as *testaceus*, *maritimus* and *melanocephalus* is not satisfactory, considering the character, as given by Fowler* and Ganglbauer†, upon which the group is based. This character is the presence at each side of the thorax of a number of large punctures arranged more or less in the form of a crescent. Fowler separates off this group sharply from the other, which he describes as having "thorax without larger punctures at sides," but Ganglbauer more accurately says that there may be at each side of the thorax in *minutus* and *coarctatus* a few somewhat larger punctures.

Now this series of punctures is quite distinct in *testaceus*, *maritimus* and *melanocephalus*, but in *nigricans* it is much less marked. Large punctures are undoubtedly present in many specimens, if not all, of *minutus* and *coarctatus*, and in some specimens the series is as distinct as in some specimens of *nigricans*. It was this point which first caused me to carefully examine the species.

Fowler does not mention the fact that the tarsal claws of the males of the species have a distinct protuberance or tooth on the underside, while Ganglbauer mentions the character but makes no use of it in separating the species. For my purpose it is sufficient to refer to the tooth on the anterior claw of the anterior tarsi. In *testaceus*, *maritimus*, and *melanocephalus* this tooth is particularly well-marked and is *transversely striated*, as can be seen by removing the claw and examining it by transmitted light under a microscope of moderate power. In *nigricans* there is also a tooth to this claw, rather smaller than in the other three species, but there is *no transverse striation*. In *minutus* and *coarctatus* again the tooth is very much smaller and shows no sign of transverse striation. A glance at the figures given will show the difference in the species.

In *testaceus*, *maritimus*, and *melanocephalus* the elytra show indistinct traces of three rows of larger punctures and the fact that *nigricans* does not show these *striae*,‡ is used both by Ganglbauer and by Fowler for separating this species from the other three. In this character again we find *nigricans* agreeing with *minutus* and *coarctatus* where no trace of the *striae* is visible.

Nigricans, therefore, seems to me to be sufficiently distinct from *testaceus*, *maritimus*, and *melanocephalus*, to warrant its removal from

* Fowler, W. W., *Coleoptera of the British Islands*, 1887, vol. i., p. 223.

† Ganglbauer, L., *Die Käfer von Mitteleuropa*, 1904, vol. iv., pt. 1, p. 244.

‡ In some specimens a few larger punctures are to be found.

that group and if it is not sufficiently near to *minutus* and *coarctatus* to permit of its inclusion with them in the subgenus *Methydrus* it should occupy an intermediate position between the two groups.

With regard to the question of distinguishing the different species, the separation of *testaceus* from *maritimus* is easy. The latter species has the head testaceous, "sometimes darker in the middle," and the maxillary palpi are pale testaceous, whereas the former has a black head—not including the clypeus—and the second segment of the maxillary palpi is dark. The tarsal claws also of the male of *maritimus* are decidedly longer than those of *testaceus*.

In the character of the tarsal claws *testaceus* and *melanocephalus* approach one another closely. As a rule the former species is rather larger and lighter-coloured than the latter, and the latter usually has the second joint of the palpi testaceous, but slight difference in size and difference in general colour are not the best characters to rely upon, nor are they in this case always constant. *Melanocephalus* is occasionally light-coloured—I have a light specimen from West Norfolk. *Testaceus* is occasionally small—one small specimen was through my hands recently. The dark second segment of the maxillary palpi in *testaceus* will, as a rule, distinguish this species from *melanocephalus* in which that segment is usually testaceous, but I have two specimens of the latter species, one from Cork, the other from Antrim, in which the segment is coloured exactly as in *testaceus*. Fowler describes the head of *testaceus* as black with clypeus testaceous, and he describes *melanocephalus* as having a black head presumably including the clypeus! As a rule this distinction holds good but it cannot be relied on as I have specimens of *melanocephalus* from various localities in which the clypeus is more or less testaceous.

The colour of the maxillary palpi is not always "distinctly black at apex" in *melanocephalus* as Fowler states, as in some of my specimens it is entirely pale testaceous. The only character I can find which seems to be reliable in all cases, is the nature of the punctuation of the upper surface, which is rather coarser in *melanocephalus*, than in *testaceus*, that is, in the former the punctures are larger and farther apart than they are in the latter.

Turning now to the two small species, Fowler separates them according to the colour of the clypeus and of the last segment of the maxillary palpi.

Now the colour of both these parts is variable in *testaceus*, *melanocephalus* and *nigricans*, especially in the two latter. In *melanocephalus* as I have said we get all grades of colour in both parts from black to more or less testaceous. In *nigricans* also we get the same range of colour in the clypeus, while the palpi, which are usually pale testaceous may be clouded at their apices. These characters therefore would not seem to be reliable ones on which to separate *minutus* from *coarctatus*, and Ganglbauer excludes the one as to the clypeus, since he mentions that in the former species there may be a small patch of brownish yellow on each side of it.

I can detect very little difference in the tarsal claws of the males in the two species; in *minutus*, the tooth is slightly larger than in *coarctatus*, but the difference is too slight to use as a character for separating the species in practice.

Here again the most reliable character for separating them seems

to be the nature of the punctuation of the upper-surface, but especially of the scutellum. In these two species, as in the case of *testaceus* and *melanocephalus*, as a rule, there is no difficulty in allocating individuals; *coarctatus* is usually lighter in colour and broader in shape than *minutus*, and in the typical examples Fowler's characters generally—but not always—hold good. After examining between 50 and 60 specimens and separating them into two groups according to the coarser or finer punctuation of the scutellum—as seen under the microscope—I found that all the typical *coarctatus* fell into the one group with finer punctuation and all the typical *minutus* into the other with coarser punctuation.

I would therefore separate the six species according to the following characters:—

1. Elytra with indistinct traces of three punctured striæ on each. Tarsal claws of ♂ with transversely striated large tooth 2
Elytra without traces (or at most with a few large punctures) of striæ.
Tarsal claws of ♂ with slightly smaller tooth not transversely striated 4
2. Tarsal claws of ♂ longer. Head, clypeus, and maxillary palpi entirely testaceous = MARITIMUS, Thoms.
Tarsal claws of ♂ shorter. Head black, clypeus black or testaceous .. 3
3. Punctuation of uppersurface finer. Second segment of maxillary palpi dark. General colour of upper surface lighter. Clypeus usually testaceous = TESTACEUS, F.
Punctuation of upper surface coarser. Second segment of maxillary palpi usually light. General colour of upper surface usually darker. Clypeus generally black (but may be more or less testaceous) = MELANOCEPHALUS, Ol.
4. Size larger (5mm.-5½mm.). Anterior claw on anterior tarsi of ♂ with tooth about half the length of claw. No dark suture to elytra = NIGRICANS, Zett.
Size smaller (3½mm.-4mm.). Anterior claw on anterior tarsi of ♂ with very small tooth. Elytra usually with dark suture 5
5. Punctuation of scutellum coarser. Size usually smaller, and shape narrower. Colour generally darker. Clypeus generally black, but may have a yellow spot on either side = MINUTUS, F.
Punctuation of scutellum finer. Size usually larger, and shape broader. Colour generally lighter. Clypeus generally (always?) with a yellow spot at each side = COARCTATUS, Credl.

With regard to the distribution of these species in Britain, the records are at present not very numerous, but certain points seem to stand out.

Both *testaceus* and *maritimus* show a decided southern distribution. There is one Scottish record for the former (S. Aberdeen, Murray, 1853), but Dr. Sharp does not include it in his "Coleoptera of Scotland" 1871-8. This species occurs at Chaloner's Whin, York (Yorks mid-W. district) and is also recorded for south Lancashire, but these are the most northern records I can find, and the insect is certainly commoner farther south. Similarly *maritimus* is common in the S.E. of England and in East Anglia but does not occur in the north or west. The Southport record, mentioned by Fowler, has been dropped in more recent Lancashire lists, and the only other north of England records are the specimen at Greatham, Durham, many years ago, and a record for Eston Marsh (Yorks N.E. district) in 1901. Other southern species, such as *Hydaticus transversalis*, and *Pelobius tardus*, Herbst, are recorded as far north as Yorkshire, but this seems to be about the northern limit of distribution of the southern group. I

must except the south-western corner of Scotland from this statement as one or two southern forms occur there, but I will deal with this interesting point in a paper which will shortly be ready upon the aquatic Coleoptera of the Solway district.

Both *testaceus* and *maritimus* are found in the N.E. of Ireland as well as in the south. The latter is a coast species but is not recorded from the north-west—Mayo, Sligo, Donegal or Derry. Otherwise the records are sufficient to indicate that it probably occurs in all the other coast counties, and from my experience in Cork and Antrim it is probably a common species throughout. *Testaceus*, although recorded from Armagh, Down, Roscommon, Wexford and north Cork, is apparently not a common species in Ireland. The southern tendency in the distribution of this species in England is curious in view of the fact that in Siberia it ranges from Yeniseisk in the north, to Turkestan in the south.

It is difficult to describe the distribution of the next two species, as the records do not at present indicate any definite localisation. *Melanocephalus* has a wider distribution than either *testaceus* or *maritimus*, and is a fairly common species in the southern Scottish peat-mosses, but I know of no record farther north than Elgin, perhaps because the district has not been much worked! The distribution of *nigricans* agrees generally with that of *melanocephalus*, and perhaps both species belong to Watson's "British" type. Both species occur in Ireland but the records are at present few.

With regard to *minutus* and *coarctatus* the records are a little more definite. *Minutus* is either absent from, or rare in, the eastern and south-eastern counties of England, with the exception of Surrey, where it is more often recorded than *coarctatus*. It is a fairly common species in the north of England and south of Scotland, occurring chiefly in peat-mosses in the sphagnum water-holes. Dr. Sharp records it from the Tay district, and he also records *coarctatus* from the same district, but for this latter species I know of no other Scottish record, except for the three south-western counties where it is fairly common. It is a fresh-water marsh species, as distinct from a peat-moss one, and, although it occurs with *minutus* in some localities, e.g., Chaloner's Whin, York, they are not normally members of the same group.

Coarctatus then would appear to be a more southern species than *minutus*, yet in Ireland the former species occurs in the north, south and east, whereas *minutus* is so far only recorded from south Kerry and north Cork. The Irish distribution of this latter species is therefore rather extraordinary. Species confined in Ireland to the south-west, are usually regarded as the remnants of the Lusitanian fauna and flora which originated in south-west Europe, and such species do not occur in the highlands of Scotland; yet here is a species typically an inhabitant of peat-mosses, which abounds in "the land of bogs" apparently confined to a small area in the south-west of the country.

It may be possible to better understand the curiosities in the distribution of these species, after a more extended study of the distribution of all the water-beetles, but at present, and in view of the comparative scarcity of records, it would be useless to attempt to explain the causes of them.

DESCRIPTION OF PLATE IV.

Anterior claw of anterior tarsus of the six British species of *Philydrus*, Sol.
 × 400— 1. *Philydrus testaceus*, F. 4. *Philydrus nigricans*, Zett.
 2. „ *maritimus*, Thoms. 5. „ *minutus*, F.
 4. „ *melanocephalus*, Ol. 6. „ *coarctatus*, Gredl.

In connection with the drawings it should be noted that the tooth of the tarsal claw does not naturally lie in the same plane as the claw, but projects outwards to the side, so that in mounting the claw for the microscope the cover-glass presses the tooth slightly out of its natural position.

Lepidopterological notes from Co. Fermanagh.

By J. E. R. ALLEN, M.A.

These notes, on the season of 1907, will not be very complete, as I was away during August and part of September, and was compelled by various engagements to neglect some methods of collecting, *e.g.*, sugaring and sawing. The captures, except where otherwise stated, were in the neighbourhood of Enniskillen.

The first capture worthy of note was larvæ of *Melitæa aurinia* on March 30th, one large nest, of which a few individuals had just moulted. On April 7th, in a different locality, they were found in clusters of a few, or singly, and of various sizes. On May 5th they were still plentiful, and nearly fullfed. On May 6th, I made an expedition to Correl Glen, a rather remote place among the hills, chiefly for a night hunt for larvæ. *Callophrys rubi* was found asleep on the heath, and very conspicuous in the lantern light. A late-flowering willow produced *Pachnobia rubricosa* in plenty, *Xylocampa areola*, and the commoner willow-frequenting species. *Eupithecia pumilata* was taken, and larvæ of the following—*Cosmotriche potatoria*, *Triphaena comes*, *Noctua glareosa*, *Crocallis elinguaris*, and *Boarmia repandata*. Another expedition to the same place on May 11th gave the following additional species—*Pararge egeria*, *Vanessa io*, *Ematurga atomaria*, *Eupithecia nanata*, *Cidaria suffumata*, *Larentia salicata*, *Panagra petraria*, *Calocampa vetusta*, and, among larvæ, one of *Oporabia autumnata*, quite small, found accidentally on a willow catkin.

The weather about this time was wet and cold, but sandwiched in the bad weather were two fine, hot days, May 18th and 19th, of which, fortunately, I was able to take advantage. On Benaughlin, another remote locality in a different direction, I took larvæ of *Oporabia autumnata* var. *filigrammaria* in plenty, dark-green larvæ with conspicuous stripes, feeding chiefly on heath on the hillside; also larvæ of *Cidaria immanata*, *C. testata*, *Larentia caesiata*, *L. didymata*. A pair of *Aglais urticae*, in cop., came unexpectedly tumbling into the tray from a clump of heath. *Tephrosia crepuscularia* (*biundularia*) was first taken on fir-trunks on May 20th, a very late first appearance. Larva-beating on May 24th produced, among other things, *Oporabia dilutata*, *Hybernia rupicapraris*, *Cheimatobia brumata*, *Cleora lichenaria*. In a day-expedition to Correl Glen, on May 25th, *Celastrina argiolus* was taken, and larvæ of *Oporabia autumnata*, *C. boreata*, *Hypsipetes sordidata*, *Himera pennaria*, *Hybernia aurantiaria*, and *Lasiocampa quercus*, in addition to many previously mentioned. A new foodplant for *Oporabia autumnata*, namely, bilberry, was added to the list, one larva being beaten from a bush overhanging the road. This larva was almost uniform apple-green, like those taken from the neighbouring birches. I may here mention that *O. var. filigrammaria* emerged from August 10th to September 11th, while *O. autumnata*, from wild larvæ, did not begin to appear till September 25th. The mountain-bred var.

jiligrammaria show a wide range of variation, some resembling the forms prevalent on the Lancashire and Yorkshire moors, while others are indistinguishable from typical woodland-bred *O. autumnata*.

The next thing worth mentioning is *Oporabia christyi*, larvæ beaten from beech May 28th, along with a few *Ennomos quercinaria*. Larvæ of *Tethea subtusa* were taken on aspen on various islands in Lower Lough Erne. One taken unexpectedly on May 15th was fullfed by May 27th; but, on June 2nd, I took a large number, none of which were fullfed. *Eurymene dolabraria* appeared on May 25th; *Coremia designata*, May 31st; *Nola confusalis*, June 5th; *Eupithecia exiguata* and *Ligdia adustata*, June 7th; *Melanthia albicillata*, June 10th; *Lobophora hexapterata*, June 11th; *E. pygmaea*, June 16th. Larvæ of the following were taken:—*Plusia festucae*, *P. iota*, *P. chrysitis*, *Eubolia limitata*, *Taeniocampa populeti*, *Abraxas grossulariata*. Of the last-named I bred a good number, and obtained a few with the yellow band wider on the forewings and continued on the hindwings.

Some "pug" larvæ, beaten from flowering branches of hawthorn trees, deserve special mention. From larvæ thus taken in June, I had previously bred *Eupithecia dodoneata*, *E. castigata* and *E. coronata* in April; *dodoneata* in one case passing two winters in the pupa. This year I beat a number of larvæ, from June 26th to July 5th. From them *E. coronata* began to emerge on July 19th, and in July and August I bred about twelve *E. coronata* and three *E. castigata*. Some are still in the pupa.

On July 10th, I took *Coenonympha typhon* at Correl Glen. At flowers in the garden at Enniskillen I took *Plusia pulchrina* first on June 14th; *P. gamma*, June 19th; *P. chrysitis*, June 25th; *Habrostola tripartita*, July 1st; *Plusia bractea*, July 14th; *P. festucae*, July 17th; *P. iota*, July 18th. *Habrostola triplasia* and *Dianthoecia conspersa* usually occur, but I have no record of them for this year. *Plusia bractea* was unfortunately scarce and in bad condition.

I was away from Enniskillen from July 26th to September 17th. On September 19th, near Enniskillen, I took one *Melanthia bicolorata*, in good condition, apparently of a second brood. *Oporabia dilutata* was first seen September 28th, *Cidaria miata*, September 29th; *C. siderata*, October 3rd; *O. christyi*, in its favourite locality, October 5th; *O. autumnata*, October 11th; *Xylina ornithopus*, on a tree-trunk, October 19th. Among the few larvæ taken in the autumn were those of *Habrostola tripartita* and *H. triplasia*, *Macrothylacia rubi*, *Phragmatobia fuliginosa*, *Eupithecia minutata* (on scabious flowers, "var. *knautiata*," I suppose.)

I have omitted many common species; but lest it should be thought that they do not occur, I may say that *Camptogramma bilineata*, *Melanippe montanata*, *Spilosoma menthastri*, *Apamea gemina*, *A. didyma* (to mention the commonest) are as abundant in Ireland as in other parts of the kingdom, and as persistent in their attempts to attract the collector's attention to their unworthy selves.

The eggs of *Cyclopides palaemon* and *C. sylvius* and their Thymelicine affinities (with three plates).

By T. A. CHAPMAN, M.D., F.Z.S., F.E.S.

(Concluded from p. 16.)

Of the two species, *C. palaemon* and *C. sylvius*, the egg of *C. palaemon* is the least eccentric in form (see pl. i); it is so nearly round (in vertical

view) that, with only one or two specimens to examine, it might readily be overlooked. With *C. silvius*, it at once attracts attention on a careful view. The difference when measurements are taken is not great, but it is, nevertheless, very obvious to the eye. *C. palaemon* is decidedly also the larger egg—its longest diameter being 0·81mm., that of *C. silvius* being 0·72mm., the transverse diameters are respectively 0·72mm. and 0·63mm. The difference in each case being 0·09mm. This is, however, $12\frac{1}{2}$ per cent. of the long diameter of *C. silvius*, and under 11 per cent. of that of *C. palaemon*. The heights are: *C. palaemon*=0·58mm., *C. silvius*=0·50mm. These are, however, less reliable measurements than the others, the practical difficulties of getting an exactly lateral view of these rounded eggs being so great.

In both, the micropylar depression is 0·15mm. across, and the rosette about 0·03mm. The flattening at top looks wider than this on a side view, the top being really a little flattened outside the depression proper.

The sculpturing seems to be of identical character in both eggs, but, in *C. palaemon*, the raised ribs are larger and thicker; they are, however, even in *C. palaemon*, so slight and delicate, that it would be more correct to say they are still slighter and more delicate in *C. silvius*. In a favourable light they can be seen with certainty round the micropylar depression (in the living egg), and for a little way down the outside slope; lower down they seem to be absent. They form an irregular polygonal network, nowhere definitely hexagonal, and with the radial diameter of the cells longer than the circumferential. In *C. palaemon* the diameter of the cells of the netting are 0·03mm., rather more or less according to which diameter is taken, and smaller close up to the depression. The ribs are the merest threads as compared with the size of the cells. In *C. silvius* the cells are fractionally smaller. The cells are occupied by a pavement of dots or rounded nodules, at least, they look so, but no elevations are seen on a profile view; these nodules continue of precisely the same character over the lower part of the egg where no netting exists. In neither egg is there the slightest trace of any upright ribbing.

The annexed plates (plates ii and iii), from photographs by Mr. F. N. Clark, will give a better idea of the sculpture and structure of these eggs than prolonged description. Plate ii shows the micropylar area in *C. palaemon* magnified 250 diameters. The substance of the egg-shell is so strong and solid that it cannot be flattened down without various fractures, obvious enough in the plates. The pl. ii., fig. 1, is focussed to the outer surface of the egg-shell, and shows very well the micropylar rosette, and further out the polygonal network. Plate ii., fig. 2, is precisely the same object, but viewed with the focus set to the inner surface of the shell. The micropylar rosette is less distinct, and the whole surface outside it is seen to be studded with dots (raised points?), arranged in an orderly but irregular manner. The outer surface of the egg-shell, therefore, carries the ribs; the inner is decorated in this very different way. The dots of the inner surface are, in their alignment, largely dominated by the outside ribbing. Plate iii., fig. 1, is a similar portion of the egg of *C. silvius*, the focussing being to the inner surface of the shell. The cells of the micropylar area are, however, tolerably distinct. The

dots of the inner surface are extremely definite, and their arrangement is such as here and there to indicate where the outside ribbing exists, the dots often seeming to be arranged in the cells. Plate iii., fig. 2, shows the micropylar area of the egg of *Adopaea flava*: the rosette is very plain; the sculpturing, which is a network of cells, not very different from that of *Cyclopides*, nevertheless has the boundaries of the cells unmarked by ribs, and the interior dots are not, apparently, present; the outlines of the nearly hexagonal cells are, however, barely visible under the microscope, but at the angles where these cells meet are very marked lines that seem to be pores in the egg-shell, but also might easily be taken for minute hairs. I have no doubt, however, that they are lines in which the three cells meet, their lengths indicating the thickness of the egg-shell; whether they are pores or more solid material remains for me doubtful—a considerable number of them are visible in the figure. In some older preparations, however, where egg-contents have adhered in minute quantity, apparently to the inside of the shell, the network is quite visible, and has much the same appearance as that of *C. palaemon* (pl. ii., fig. 1). It is to be noted that, in the case of *flava*, this is shown by the trace of egg-contents having darkened by lapse of time. The egg-shells are practically colourless, and what the microscope (and figures) show is an effect of refraction (pl. ii., fig. 1), showing the ribs rather wider than, in viewing them in other ways, one concludes they really are.

DESCRIPTION OF EGG.—*C. palaemon* (June 15th, 1907).—Egg palest straw in colour, bun-shaped, but oval as seen from above. Longest diameter, 0·81mm.; shortest diameter, 0·72mm.; height, 0·58mm. Base flat, with margins sharply rounded. Upper part almost exactly of spherical outline, with the top flattened for a width of about 0·24mm.; in the centre of this is a very shallow, circular depression, 0·15mm. across, with, apparently, steep walls and flat floor, the micropylar rosette is in the centre of this, 0·03mm. in diameter, and on these views looks raised, but this may be an effect due to the cells of the rosette giving a special appearance of light and shade. The depression seems of slightly longer diameter parallel with the longer diameter of the egg. The depression outside the rosette seems to have a very fine netting, but this cannot be clearly seen in the living egg. Outside the depression, on the top of the egg and a little way down the side, is an irregular network marked by very fine, slender, raised ribs, only visible in a good and favourable light. The cells of the network are about 0·03mm. across, longer in the radial direction of the egg than across, irregular in form, hardly capable of being called roughly hexagonal. No trace of the netting can be made out on the sides of the egg, but here, and within the cells, the surface is covered with fine granules or nodules of uniform size. June 22nd.—The hollow on top is now more of the character described in Tutt's *Brit. Lep.*, vol. viii., p. 201, it is almost a pit, with the micropylar centre as a small, raised hill. This sinking of the top is, no doubt, of the same nature as the "dent" in many eggs, *viz.*, due to evaporation. The egg-shell is extremely hard and strong, and would not "dent" anywhere except under considerable force. What would happen could denting not occur, is not quite easy to guess, but here is a definite provision for it. Close observation is desirable to ascertain in other eggs how far the "micropylar depression" exists immediately the egg is laid, and whether it is not formed later by this evaporating process. The ribs forming the cells on the eggshell would appear to be external, but the dots, or points, with which the egg is covered, seem to be internal, or on the inner surface or substance of the shell. The micropylar rosette and a small area round it are quite free from these two structures. Here there are only the cells forming the rosette, which are marked off from each other by lines only. The rosette of cells is about 0·108mm. across, the pellucid area surrounding it about 0·2mm.* The

* These measurements do not agree with those of the fresh egg, where the micropylar depression was found to be 0·15mm. across on June 15th, to-day (June 22nd) the depression is found to be 0·24mm., showing that it became wider as the depression deepens, and certainly makes it probable that when laid there is no depression at all.

centre of the rosette consists of four or five cells, not very regular, so that there are five in one case, four in another, then four or five rows of cells, having a thatched appearance from the centre, so that the outer cells look as if they are pear-shaped, but the narrow ends are covered by the next interior ring. In the centre, in or beneath the central cells, are eight dark (in most lights but no doubt merely dark as the result of refraction) lines, radiating from the centre, but starting at a little distance from it, two opposite each other, and three on each side of the transverse lines so formed, and a little further from the central point than these two. These do not come out in the photograph. In the structureless zone round the rosette, one fancies sometimes traces of cells exist and link up the micropylar cells to the others, this seems doubtful. In the egg-shells mounted on slides the hexagonal network of fine ribs is seen to extend quite to the base of the egg, though it is practically impossible to see this in the living eggs.

The egg of *C. silvius* differs from that of *C. palaemon* in being smaller; the long diameter, 0.72mm.; the shorter, 0.63mm.; height, 0.50mm. The difference in the two diameters is, therefore, proportionally greater. The threads of the network are finer and more delicate than in *C. palaemon*, delicate and difficult to see as they are in that species.

DESCRIPTION OF PLATE I.

PHOTOGRAPHS OF EGGS OF CYCLOPIDES, FROM HERR M. GILLMER.

Fig. 1.—Four eggs of *Cyclopides palaemon*, one on side $\times 20$ diameters.

Fig. 2.—Three eggs of *Cyclopides silvius*, side view $\times 20$.

Fig. 3.—Same eggs, top view $\times 20$.

DESCRIPTION OF PLATE II.

Fig. 1.—Micropylar area of egg-shell of *Cyclopides palaemon* focussed to external surface.

Fig. 2.—Micropylar area of egg-shell of *Cyclopides palaemon* focussed to internal surface $\times 250$.

The black and white shown is a result of refraction, not of colour in the shell. The ribs (in 1) are undoubtedly raised lines on the outside, and would appear narrower with a slight variation of focus. The dots in fig. 2 are probably raised points on the interior surface, but may be merely denser material (or even hollows) in or close to the interior surface. A close comparison of figs 1 and 2 shows these dots are arranged with some reference to the cells of network.

DESCRIPTION OF PLATE III.

Fig. 1.—Micropylar area of *Cyclopides sylvius*, egg-shell focussed to inner surface, a figure of the outer surface is not given, but the lines of its network are suggested here by the arrangement of the dots more clearly than in the case of *palaemon*. The cells of the micropylar rosette are seen to be much larger and broader than those of *C. palaemon* and, occupying much the same area, have fewer cells and in fewer rows.

Fig. 2.—Micropylar area of *A. flava*. The cells of the rosette are larger and narrower than in *C. palaemon*. The little black lines (again an effect of refraction from slightly different material) mark the angles of the cells of the network much like that in *Cyclopides*. Whether due to these eggs never having been laid or to some other cause, I could not demonstrate this netting, which was evident enough in *Cyclopides*, but I see in some older mounted specimens that it comes out very similarly indeed to that of *C. palaemon* in plate iii., fig. 1.

Additions to the Coleoptera of Northumberland and Durham, 1907.

By R. S. BAGNALL, F.E.S.

During 1907, my opportunities for collecting were more than usually limited, but, by specialised work, several interesting beetles were taken. Thus one evening I tried shingle-collecting and took *Euplectus minutissimus* and other rarities, as well as a rare Collembolid (*Anurida tullbergi*, Schött), previously unknown as British

and which occurred in great profusion. It is very certain that systematic research in other parts of Northumberland and Durham will produce many other interesting additions to the Counties' Fauna.

During the year, two more Longicorns have been imported, *Cordylomera suturalis*, Chev., with mahogany, and *Cyllene crinicornis*, Chev., in numbers, with lignum-vitæ from the West Indies.

Many rare beetles, for the most part recorded have also occurred, including the following additions to the counties' list. *Aleochara cuniculorum*, Kr., from a badger's burrow, Spen banks, Co. Durham. *A. succicola*, Th., *A. moerens*, Gyll., and *A. spadicea*, Er., var. *procera*, Er., are in Mr. Gardner's collection from Hartlepool. *Homalota longula*, Heer, *H. subtilissima*, Kr., in numbers, and a few examples of *H. evilis*, Er., *H. pallens*, Redt. (?), from shingle, Winlaton Mill. *H. aequata*, Er., *H. linearis*, Gr., and *H. pilicornis*, Th., from beneath bark, Gibside. *Philonthus cruentatus*, Gmel., in vegetable refuse, rare. *Thinobius longipennis*, Heer, in shingle, Winlaton Mill. *Homalium planum*, Pk., under bark, Derwent Valley and Tynedale. *H. pineti*, Th., under bark of a fir-log, Egglestone in Teesdale. *Hapalaraea pygmaea*, Pk., Winlaton Mill. *Colon latum*, Kr., a single specimen from dead grass refuse in nest of mouse, Gibside. *Euplectus signatus*, Reich., a single specimen; *E. minutissimus*, Aub., not rare in shingle, Winlaton Mill. *Micrurula melanocephala*, Marsh., very local, found in numbers early in the year on a certain clump of bird-cherry trees, Winlaton Mill. *Meligethes serripes*, Gyll., specimens evidently referable to this species from the flowers of bugle (*Ajuga reptans*) and hedge-nettle (*Stachys*). *Enicmus fungicola*, Th., taken by my friend Mr. Gardner in Teesdale. *Cartodere elongata*, Curt., a solitary example in fungoid growth on a log, Alnwick. *Silvanus similis*, Er., a living specimen found floating in a plate of pineapple syrup; it may possibly have been brought in from the woods on my clothes. *Ennearthron cornutum*, Gyll., from a polyporus, Teesdale. *Hypophloeus bicolor*, Cl., Alnwick.

The Brachypterous Cryptinæ.

By ERNEST A. ELLIOTT, F.E.S.

Great difficulty is experienced in identifying Brachypterous forms of the subfamily *Cryptinæ*, from the fact that the metathoracic costæ and the areolet of the wing, which are among the most important characters made use of in defining the subdivisions, are, if not entirely wanting, yet different from the form typical of the group to which these insects individually belong. In the hope of rendering some assistance in this matter, I have prepared the following table, for females only. I have not found it possible to arrange them in the order of Mr. Morley's *Ichneumons of Britain*, vol. ii. (1907), but do not consider this of any importance.

By a curious oversight Mr. Morley has given us an impossible description of the genus *Oresbius*, Marsh. Its author, in his original description (*Ent. Mo. Mag.*, iii., 1867, p. 193), says of the basal segment: "basi latissimum, apicem versus gradatim angustatum." This is evidently to be understood in the Gravenhorstian sense, the postpetiole being the "pars antica," and thus the end of the segment

furthest from the thorax becomes the "base."* The formation of this segment in *Oresbius* is shown by the illustration to be normal, and Marshall states that the genus differs from *Aptesis* only in the unicolorous antennæ. Hence it appears that, in Mr. Morley's table of the genera of the *Phygadeuonini* (*Ichn. Brit.*, ii., pp. 2, 3) the first and last sections should be deleted, and after no. 21 should be inserted:—

Antennæ of female white-banded	MICROCRIPTUS.
Antennæ of female unicolorous	ORESBIUS.

The position of *Apterophygas paradoxus*, Bridg., is a matter of considerable difficulty. It certainly cannot be correctly placed in *Cremnodes*, because the distinctive character of that genus is the almost entire absence of a metanotum, the costa bounding the petiolar area closely approximating the base of the metathorax; and in *A. paradoxus* the metanotum and the petiolar areas are of equal length. At the same time it must be acknowledged that the insect does not correspond with the published description of any known genus, and it would be highly undesirable to found a new genus upon a single specimen, which I am inclined to regard as abnormal.

As nothing has hitherto been known of the economy of *Cremnodes atricapillus* it is interesting to note that Mr. Morley has identified a specimen in Cameron's collection, bred from a Dipterous leaf-miner on primrose (*cf. Ann. Scot. Nat. Hist.*, 1907, p. 90).

TABLE OF GENERA AND SPECIES.

(Numbers after species refer to pp. in Mr. Morley's work.)

(4.) 1. Wings wanting.	
(3.) 2. Segments 2 and 3 connate, and occupying most of abdomen	THAUMATOTYPUS, 239.
(2.) 3. Segments 2 and 3 normal.. .. .	PEZOMACHUS, 177.
(1.) 4. Wings present, but never fully developed.	
(6.) 5. Terebra as long as abdomen; metathoracic areæ complete	OBSIPHAGA, 60.
(5.) 6. Terebra not more than half as long as abdomen; metathoracic areæ rarely complete.	
(16.) 7. Terebra longer than basal segment.	
(15.) 8. Penultimate tarsal joint bilobed	SPILOCRIPTUS, 270.
(12.) 9. Thorax entirely black.	
(11.) 10. Anterior coxæ red	<i>S. incubitor</i> , 271.
(10.) 11. Anterior coxæ black	<i>S. migrator</i> , 275.
(9.) 12. Thorax not entirely black.	
(14.) 13. Only scutellum red.. .. .	<i>S. abbreviator</i> , 278.
(13.) 14. Thorax entirely red	<i>var. hopei</i> , 279.
(8.) 15. Penultimate tarsal joint not bilobed	PLECTOCRIPTUS <i>griseus</i> , 9.
(7.) 16. Terebra not longer than basal segment.	
(20.) 17. Terebra less than half basal segment.	
(19.) 18. Metathorax sloping from base	CREMNODES <i>atricapillus</i> , 62.
(18.) 19. Metathorax not sloping from base; metanotum as long as petiolar area	CREMNODES <i>paradoxus</i> , 62.
(17.) 20. Terebra longer than half basal segment.	
(22.) 21. Wings clouded, with hyaline fascia	SPINOLA <i>fulveolatus</i> , 115.
(21.) 22. Wings without fascia.	
(36.) 23. Area of metathorax complete	PHYGADEUON, 71.
(27.) 24. Segments 2 and 3 occupying almost whole of abdomen.	
(26.) 25. Thorax black	<i>P. heinemanni</i> , 79.

* "Segmentum primum . . . Pars antica, inter tubercula ista et margina apicalem segmenti sita (in *Monographia Ichn. pedestrium minus apte area nuncupata*) plurimis speciebus latior est parte postica."—Grav., *I. E.*, i., 85; *cf. Morl., I. E.*, ii., 3.

- (25.) 26. Thorax red *P. gravenhorsti*, 80.
 (24.) 27. Segments 2 and 3 normal.
 (29.) 28. Petiolar area nitidulous *P. variabilis*, 88.
 (28.) 29. Petiolar area more or less rugose.
 (31.) 30. Petiolar area only centrally rugose *P. assimilis*, 89.
 (30.) 31. Petiolar area entirely rugose.
 (33.) 32. Two basal segments sharply aciculate *P. procerus*, 78.
 (32.) 33. Two basal segments not aciculate.
 (35.) 34. Segment 2 alutaceous; eyes naked *P. marshalli*, 93.
 (34.) 35. Segment 2 punctate; eyes densely pubescent *P. rotundipennis*, 100.
 (23.) 36. Area of metathorax incomplete.
 (48.) 37. Basal abdominal segment punctulate, not aciculate.
 (39.) 38. Antennæ unicolorous *Oresbius castaneus*, 108.
 (38.) 39. Antennæ tricoloured *Microcryptus*, 23.
 (41.) 40. Head very large, twice as broad as thorax *M. graviceps*, 49.
 (40.) 41. Head normal.
 (43.) 42. Thorax without areæ *M. nigrocinctus*, 41.
 (42.) 43. Thorax with more or less distinct areæ.
 (45.) 44. Metathorax red, with broad black central vitta *M. brachypterus*, 50.
 (44.) 45. Metathorax unicolorous.
 (47.) 46. Metathorax red *M. labralis*, 52.
 (46.) 47. Metathorax black *M. micropterus*, 51.
 (37.) 48. Basal segment more or less aciculate *Hemiteles*, 116.
 (50.) 49. Segment 2 aciculate *H. hemipterus*, 154.
 (49.) 50. Segment 2 smooth.
 (52.) 51. Scutellum red *H. subzonatus*, 140.
 (51.) 52. Scutellum black *H. pedestris*, 138.

Notes from the Wye Valley: the Vanessids in 1907.

By J. F. BIRD.

This has not been a very good season from a collector's point of view, but we have found it interesting with regard to the Vanessids. Judging from ova and larvæ of *Polygonia c-album*, found from the last day of March to the beginning of July, and larvæ of *Aglais urticae*, in June and July, the ovipositing of the hibernated females of both these species appears to have been much protracted; the cause, no doubt, being the abnormally dull and cold weather we have experienced this year; the fine "butterfly days" so few and far between.

Polygonia c-album.—Only one hibernated specimen of *P. c-album* was observed in the spring, a female, which frequented our garden on March 31st and April 1st, when I watched it ovipositing on *Ribes* (vide vol. xix., p. 125). I have already mentioned (p. 126) the length of time it took for the first two larvæ, that hatched from ova we obtained, to eat their way out from their shells, and it seems, from further observations, that about twelve hours is the average time for this operation. Perhaps the table on p. 38, showing dates of hatching, moulting, etc., of some of these will be found of interest.

I should like to have added the sex in each case, to compare with the number of keels of the ovum, but do not feel sufficiently certain that I can tell. I fancy it is easier to distinguish the sex of specimens met with in the natural state.

Emergence generally takes place in the early morning, but a few we have bred came out at other times of the day, though rarely at night.

Besides obtaining ova in April, in May we also found, on our

currant-bushes, several of the larvæ, which we left for observation and also because we wished to find a pupa *in situ* for Mr. H. Main for photographing. The larvæ live on the underside of the leaves and are very easy to discover on currant, especially during the first two instars. When one has learnt to recognise the peculiar elongate holes the young larvæ make in the leaves, a cursory glance round a bush will almost be sufficient to see if any larvæ are present. They are generally to be found on the outer leaves, a little lower than half-way down, but as they grow, they climb upwards, and, when full-fed, pupate at the top of the bush, attaching themselves by their tails to the projecting ends of twigs that have been pruned away from the stems. "Wild" larvæ on our currant-bushes, most likely progeny of the same female that laid the ova we obtained, were not so forward as those kept in confinement, and probably emerged about a fortnight later. On July 1st, before any we were rearing had emerged, or any imagines seen at large, my father found a young larva feeding on wych-elm, and on the next day I found another on the same tree, suspended for pupation to a vein on the underside, near the base and towards the edge of a leaf growing on one of the low branches. This pupated on the 3rd and emerged seventeen days later. On July 7th, I found two more on currant, not many days old, in fact, still in the first instar. As will be seen in the table, the first bred one emerged on July 6th. In the natural state, the summer brood were seen flying from July 24th until September 9th. This brood was fairly numerous, at least the males were; I only saw three I am pretty sure were females. The undersides of this species may be roughly divided into three groups, (a) light marbled, (b) dark marbled and (c) plain, almost black. According to our experience, groups *a* and *b* belong more particularly to the summer brood, while group *c* is the "type" of the autumn brood. It was noticed this year that the summer brood had much darker undersides than usual. Examples of groups *a* and *b* were, I think, much the rarest, group *a* being exceedingly scarce; while most of the specimens bred belong to group *c*. Of the three "wild" females seen, one, which I did not succeed in catching, had a light marbled underside, while the other two had very dark undersides. The two latter I netted and posted to Mr. Main, who wished to try for ova. He tells me that the first one, which I sent him at the beginning of August, lived a month, but did not lay a single egg. The other one, posted on September 9th was, unfortunately, lost *en route*, the box containing it being so roughly handled that the butterfly must have escaped (I am wondering if this species will be recorded in the near future in some unusual locality between Monmouthshire and Essex). On the latter date, September 9th, I noticed a good number of these butterflies about, all busily feeding at various flowers. This was the last date upon which I saw the summer brood on the wing. In consequence of the inclement weather, I fancy the number of those hibernating through the approaching winter will be considerably increased by members of the summer brood. It would be interesting to hear if anyone has ever succeeded in obtaining ova from a female of this brood belonging to group *c* with a plain dark underside, or do all those with such undersides hibernate, as well as the autumn brood? I believe it has been frequently stated that only specimens with plain undersides have been noticed in the spring.

	Date when egg was		No. of keels.	Date when larva hatched out.	Length of egg period.	Date of 1st moult.	Duration of 1st instar.	Date of 2nd moult.	Duration of 2nd instar.	Date of 3rd moult.	Duration of 3rd instar.	Date of 4th moult.	Duration of 4th instar.	Date when larva suspended.	Date of pupation.	Duration of 5th instar.	Length of Larval Life.	Date of emergence of imago.	Length of pupal life.	Length of time from laying of egg to emergence of imago.	Length of time from hatching of larva to emergence of imago.
	laid.	found.																			
1.	31. iii.		10	22 iv.	22 dys	1 v.	9 dys	10 v.	9 dys	15 v.	5 dys	27 v.	12 dys	14 vi.	16 vi.	20 dys	55 dys	8 vii.	22 dys	99 dys	73 dys
2.	1. iv.		11	23 iv.	22 "	6 v.	13 "	13 v.	7 "	18 v.	5 "	30 v.	12 "	12 vi.	14 vi.	15 "	52 "	6 vii.	22 "	96 "	74 "
3.	1. iv.		11	23 iv.	22 "	13 v.	20 "	21 v.	8 "	27 v.	6 "	5 vi.	9 "	17 vi.	19 vi.	14 "	57 "	14 vii.	25 "	104 "	82 "
4.	1. iv.		11	25 iv.	24 "	11 v.	16 "	17 v.	6 "	26 v.	9 "	3 vi.	8 "	13 vi.	15 vi.	12 "	51 "	9 vii.	24 "	99 "	75 "
5.	1. iv.		11	25 iv.	24 "	(Died)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
6.	?	iv.	10	23 iv.	?	10 v.	17 dys	?	?	?	?	?	?	13 vi.	15 vi.	?	53 dys	9 vii.	24 dys	?	77 dys
7.	do.		11	26 iv.	?	13 v.	17 "	22 v.	9 dys	30 v.	8 dys	8 vi.	9 dys	20 vi.	21 vi.	13 dys	56 "	16 vii.	25 "	?	81 "
8.	do.		11	27 iv.	?	13 v.	16 "	23 v.	10 "	30 v.	7 "	12 vi.	13 "	(Died)	—	—	—	—	—	—	—
9.	do.		9	29 iv.	?	?	?	?	?	?	?	?	?	12 vi.	14 vi.	?	46 dys	6 vii.	22 dys	?	68 dys
10.	do.		9	29 iv.	?	?	?	?	?	?	?	?	?	12 vi.	14 vi.	?	46 "	7 vii.	23 "	?	69 "
11.	do.		10	29 iv.	?	19 v.	20 "	28 v.	9 "	5 vi.	8 "	14 vi.	9 "	28 vi.	30 vi.	16 dys	62 "	19 vii.	19 "	?	81 "
12.	do.		10	30 iv.	?	12 v.	12 "	17 v.	5 "	25 v.	8 "	4 vi.	10 "	16 vi.	18 vi.	14 "	49 "	12 vii.	24 "	?	73 "
13.	do.		10	30 iv.	?	13 v.	13 "	?	?	30 v.	?	9 vi.	10 "	21 vi.	23 vi.	14 "	54 "	17 vii.	24 "	?	78 "
14.	do.		10	30 iv.	?	14 v.	14 "	23 v.	9 "	30 v.	7 "	9 vi.	10 "	22 vi.	23 vi.	14 "	54 "	17 vii.	24 "	?	78 "

That the larvæ do not invariably pupate on the food-plant is evident. On September 1st, in the morning, I came across a larva suspended to the outer beam under the eaves of a lean-to hovel, close by the side of one of the posts supporting the roof, up which it had probably travelled. Up to midday on September 4th, it had not cast its larval skin, but, on looking later on, in the afternoon, I found it not long pupated; the integument still soft and light in colour, I have never known one take so long to pupate after suspension, but possibly the cold weather we were having at the time may account for this; the change usually occupying from 24 to 48 hours. Meanwhile, another of these larvæ had arrived on the scene and was quietly resting, three inches away from the freshly-changed pupa. Next morning, at 11 a.m., the new arrival was still unsuspended, but had spun a small cone-shaped pad of whitish silk, and was sitting in the characteristic attitude of this larva, with head curled to one side and its posterior extremity hanging downwards from the last pair of abdominal prolegs, which were clasping one on each side of the silken pad. I stood watching for some time, hoping to see it attach itself to this pad, but as it did not seem ready to oblige me, I got tired of waiting. At 2.45 p.m., I found it attached to the silk and hanging downwards; it pupated on the 7th. Neither have yet (October 14th) emerged, and although 27 days has been the longest pupal period which has, as yet, come under our notice, I think there is still a chance that one at least, the one that pupated on September 7th, may come out, as it showed signs of life on October 9th, by moving slightly. Besides these, I found two more pupæ (one dead) suspended to woodwork within the building. In a small clump of nettles, close by the shed, I discovered a pupa suspended to the base of the midrib of one of the upper full-grown leaves, and also two larvæ, which I left, to see whether they would leave their foodplant to pupate or not. When these suspended themselves, the weather had much improved, with the temperature a good deal warmer, and pupation took place much sooner than was the case with the one before mentioned. Both suspended themselves to stalks of large leaves towards the upper part of nettles, the first on September 7th, pupating on the 8th, while the other suspended itself on the 8th and had pupated on the 10th. A little larva, found on my knee on September 5th, which I must have brushed off while walking among the nettles, surprised me, on account of its small size, by pupating on the 13th of the month. We have only recorded the pupal lives of three bred this autumn, which are as follows:—

	SUSPENDED.	PUPATED.	EMERGED.	PUPAL LIFE.
1	7. ix.	8. ix.	26. ix.	18 days
2	8. ix.	10. ix.	27. ix.	17 „
3	12. ix.	13. ix.	1. x.	18 „

It has surprised me considerably, when reading up notices of this species, by various authors, that they should remark on the small flight of the first brood and the greater abundance of autumn specimens. Of course I can only claim a four years' acquaintance of this butterfly, but my experience in Monmouthshire during that time

has been exactly the opposite ; I have always found the second-brood considerably less in evidence, which I have imagined might be due to their seeking their winter-quarters almost immediately after emerging from the pupa. I may add that, up to the time of writing (October 14th), I have not seen a single "wild" specimen of the second-brood this autumn.

The larvæ feed in the day-time, and, when living on *Urtica*, have a habit of eating away some of the under half of the midrib, a short distance away from the base of a leaf, which then hangs down and provides them with a sort of tent or shelter in which they rest. They do not live gregariously, but one may always hope, on finding one, to obtain several near by, even if not on the same plant or bush. Besides mentioning *Ulmus*, *Urtica* and *Ribes*, Dr. Chenu states (*Enc. d'Hist. Nat.*) that these larvæ live on "le chèvrefeuille des buissons (*Lonicera xylosteum*), et sur le noisetier commun (*Corylus avellana*)."
Experimenting with these plants on a larva kept in confinement, I find that hazel is accepted, but apparently not much appreciated ; honeysuckle it absolutely refused to touch. Another plant I tried was swallow, by placing the larva on the bush itself. It fed immediately, without any hesitation, eating a good large piece out of a leaf, but after its meal was very uneasy ; continuing to move about from leaf to leaf, spinning webs under each, but never resting for any length of time under any of them.

Aglais urticae.—Hybernated specimens of *A. urticae* were noticed from March 21st until May 12th (In my note on the courtship of this species, vol. xix., p. 145, the date recorded there should have been May 6th and not the 16th). Notwithstanding the fact that this butterfly was unusually numerous in the spring, the nettles were, up to the end of July, remarkably free from their larvæ. Small nests were the rule and the larvæ lived more apart than is usual with this gregarious species, in leaves spun up somewhat after the fashion of *Pyrameis atalanta* ; three or four were sometimes found in one shelter, but a good many were noticed living quite solitarily, even when fairly small. Newly-emerged imagines of the first brood began to appear on July 5th, and, at the same time, quite small larvæ were still to be found ; indeed, caterpillars of this, the first brood, were to be met with throughout the first half of July. One larva, found on July 15th, suspended to its foodplant, changed to a wonderfully golden pupa two days later. The imagines of this brood continued on the wing until August 3rd. Larvæ, half-an-inch long, probably of the second brood, were noticed about the second week of August ; they finished feeding and began to pupate in the natural state about the end of the third week, and the imagines seen on the wing from September 6th. I do not remember ever having seen the larvæ of the second-brood so plentiful before.

My brother tells me of an interesting incident witnessed by him, this autumn, in his garden at Brockweir. A specimen of *A. urticae* was feeding on a ripe fallen plum, when a wasp suddenly pounced upon it and viciously snipped off one of its wings ; the butterfly shook off its opponent and tried to escape, but had only fluttered feebly a short distance, when the wasp again attacked it and soon had all the wings off. But what happened after this had been accomplished, my brother could not inform me, as he was busy directing some work he was having done in his garden.

Vanessa io.—Hybernated specimens, though common in the spring, were not so abundant as in 1906. They were observed from March 26th until June 16th. No larvæ were met with and this year's imagines were rather scarce and very late, none appearing until September 8th, more than a month later than last year.

Pyrameis cardui.—It is rather curious, considering that 1906 was decidedly a "*cardui* year," that this is the first season, since coming to this district in 1904, we have failed to meet with this insect.

P. atalanta.—I have not seen a single example of this butterfly this season, but heard that one was seen flying in the garden about the second week of September.

A Biological Inquiry into the Nature of Melanism in *Amphidasys betularia*, Linn. (*with plate*).

By H. S. LEIGH.

In connection with an investigation which I am making on the "melanism" of *Amphidasys betularia* with a view to elucidating, so far as is possible by experimental and statistical methods, the causes which operate in the production of melanic forms, it is intended to make an extensive enquiry as to the distribution, etc., of the typical, intermediate, and melanic forms of this species. I should be extremely grateful if entomologists would assist me in collecting the information concerning the occurrence and distribution of these forms by answering as many as possible of the subjoined questions.

1. Whether form A or form D occurs in a particular locality.
2. If both forms occur state, if possible, the actual numbers taken of each, or state which form predominates and to what extent.
3. State whether forms B or C occur and in what abundance. Give exact localities where each form occurs.
4. State the atmospheric character of the district, and whether it is rural with a smokeless atmosphere, or urban and smoky, or intermediate in character. Any other information of a general character will be very acceptable.

Replies to these queries on postcard, may be sent to H. S. Leigh, Zoological Department, The University, Manchester.

[We trust that as many lepidopterists as possible will give Mr. Leigh the desired information, and so facilitate his inquiries into this interesting subject.—ED.]

VARIATION.

THE VARIATION OF *XYLOPHASIA RUREA*.—The editorial query to my note on the breeding of *Xylophasia rurea* (*antea* p. 17) has led me to enter into rather more detail with regard to the aberrations bred. Altogether I took rather over 100 larvæ of this species, of which about 90 produced imagines, chiefly during the last week in June. Of these about one-third possessed markings like the type, the other two-thirds were more or less brown. I sent the pick of them to Mr. Hanbury, who wanted to renew his series, but, of those I put in my collection, I note the following: Three each with typical markings, but with three shades of ground colour which appear to correspond with (1) the type

pale grey; (2) *ab. ochrea* = yellowish-ochre; (3) *ab. intermedia* = reddish ground colour, markings of all of which vary somewhat in intensity. (N.B.—I allowed the majority of these forms to escape.) Of the second group, I noted (1) *ab. combusta*, Hb., with slight modification, and which include the majority of those bred; (2) pale grey-brown forms, as in *ab. putris*, but with no basal shade; all the nervures are dusted with whitish, giving it a peculiar almost glaucous hue; the stigmata faintly outlined with yellow-ochre; (3) like *combusta*, Haw., but the reniform outlined in very pale yellow, not white, indeed I do not think I have ever seen a specimen with what could be called a pure white circumscription; (4) clear red-brown with darker shades, reniform just indicated, this is our nearest approach to *ab. nigrorubida*; (5) the insect I incorrectly referred to *ab. alopecurus*, Esp.; this has no black costal streaks, three clear white dots on costa, lower half of reniform filled in with dark, the outer-half outlined with very light, the other half and orbicular faintly outlined, and space under the stigmata filled up with blackish; hindwings dark grey—W. G. CLUTTEN, 132, Coal Clough Lane, Burnley. February 3rd 1908.

U R R E N T N O T E S .

The last meeting of the Entomological Club was held at the Holborn Restaurant, on the evening of January 14th, when Mr. G. H. Verrall was the host. A large number of members and guests assembled at the preliminary meeting, at which many old friendships are renewed year by year. At 8.30 p.m. supper was announced. This was a coming of age supper, *i.e.*, the 21st over which Mr. Verrall has presided, and was certainly one of the most successful of the long series. A large army of members and visitors were present, and included most of the leading lepidopterists of this country, although the company showed how youth comes on whilst age retires from the more active and exciting social details that attend one even in the entomological world. The following guests were noted—Messrs. R. Adkin, E. E. Austen, F. C. Adams, H. W. Andrews, P. Barraud, F. Bouskell, Borrer, M. Burr, Rev. E. N. Bloomfield, Prof. T. Hudson Beare, Lt.-Col. Bingham, Mr. W. H. Blandford, Dr. T. A. Chapman, Messrs. F. Carr, F. Noad Clark, G. H. Carpenter, A. Cant, J. E. Collin, H. St. J. K. Donisthorpe, J. C. Dollman, Hamilton H. Druce, Dr. F. Dixey, Rev. E. Eaton, Messrs. Stanley Edwards, F. Enoch, C. Fenn, W. H. B. Fletcher, C. J. Gahan, A. Harrison, P. Harwood, F. B. Jennings, Dr. Joy, Messrs. Jenkinson, P. Jackson, O. Janson, A. H. Jones, W. J. Kaye, W. F. Kirby, W. J. Lucas, H. Main, R. S. Mitford, Rev. F. Morice, Prof. R. Meldola, Messrs. C. Morley, Guy Marshall, W. Nicholson, B. Nevinson, H. E. Page, L. B. Prout, H. Rowland-Brown, R. Shelford, V. E. Shelford (of Chicago), E. Step, P. Skinner, R. South, E. Smith, W. E. Sharp, A. Sich, Dr. Tatham, Messrs. J. W. Tutt, J. H. Tutt, H. J. Turner, J. Tomlin, A. E. Tonge, C. O. Waterhouse, E. A. Waterhouse, F. H. Waterhouse, Rev. G. Wheeler, Commander J. J. Walker, Mr. C. J. Wainwright, Col. J. W. Yerbury. The Host proposed the health of the Entomological Club, and, in a few appropriate remarks, called attention to the unparalleled loss that the small band of members had sustained in the recent death of Mr. A. J. Chitty,

whom Mr. Verrall referred to as a hardworking and earnest student of nature, and an ideal member of such a social body as the Entomological Club in its inception was intended to be. Not less did one miss Mr. Martin Jacoby, who, through all these years, has added his quota to the enjoyment of the gatherings by his masterly skill on the violin, and who had also died a brief three weeks before. Later, the President of the Entomological Society, Mr. C. O. Waterhouse, proposed the health of "Our Host," which was responded to in the most hearty manner. A very pleasant evening was spent, the company not finally breaking up till close upon midnight.

Mr. South has written in "The moths of the British Isles" (Frederick Warne and Co., price 7s. 6d. net), a companion work to the "Butterflies" noticed a few months ago. In one particular, this may be really called a "companion" work, *viz.*, in the excellence of its illustrations, but, owing to the attempt to cover so much ground, the letterpress concerning each species, accurate as far as it goes, falls considerably short of that of the first volume, except in two groups, *viz.*, the Sphingids and Lachneids, which provide excellent summaries of what has more recently been published on these well-worked superfamilies. The letterpress of the Noctuids is very meagre, but this evidently must not be laid to the author's door, as it is a mere matter of attempting to get a quart into a pint pot, for which one suspects he is in no wise responsible. Some of the wonderful "English"! names are beyond us altogether, and we wonder how many entomologists can tell us who "the Neglected or Grey Rustic," "the Northern Rustic" and "the Crescent-striped" are. The excellence of the plates will interest all lepidopterists, and we have no doubt that the letterpress will also prove valuable to those beginners who are sure to be attracted by so taking and cheap a volume.

At the meeting of the Lancashire and Cheshire Entomological Society, held December 16th, 1907, Mr. C. B. Williams exhibited a ♀ example of the olive-banded ab. *olivaceofasciata*, of *Lasiocampa quercus*, bred in 1907, from a larva obtained at Wallasey. A full and detailed account of the various specimens of this form, and those of the allied ab. *olivacea*, taken in this country, is given in the *Nat. Hist. of Brit. Lep.*, iii., pp. 86-87.

We have just read through two excellent recently-published books which should, we think, be in the hands of all entomologists. The first is by Professor Vernon L. Kellogg, and is entitled "Darwinism to-day" (Henry Holt and Co., New York, U.S.A.), a discussion of present-day scientific criticism of the Darwinian selection theories, together with a brief account of the principal other proposed auxiliary and alternative theories of species-forming. The other is by Professor D. S. Jordan and Professor V. L. Kellogg, and is called "Evolution and Animal Life" (D. Appleton and Co., New York, U.S.A.), an elementary discussion of facts, processes, laws and theories relating to the life and evolution of animals. Entomological material is largely used in the discussion of many of the problems considered, and every one interested in the general subject can read them with considerable profit. The former is perhaps the more characteristic treatise, the latter a first-class series of lectures, carefully edited and arranged for separate publication in book form.

Mr. Newbery describes (*E.M.M.*) a new beetle under the title, *Laccobius*

purpurascens, in spite of the fact that it is so closely allied to *L. nigriceps*, Th., that Deville considers it a fine "new variety" thereof. It was taken in May, 1906, crawling in swarms among the slimy ooze where water has trickled down the red sandstone cliffs on the south side of the river Teign, at Shaldon.

The Baron de Crombrughe, in his presidential address to the Société Entomologique de Belgique, pays throughout a great tribute to the excellence of the work of British micro-lepidopterists. His address comprises a general review of the principal biological features of the Nepticulides, and he asks for more workers. The concluding paragraph runs: "En consultant les auteurs et particulièrement Tutt, le chercheur assidu verra son zèle récompensé par d'autres découvertes encore. . . . La littérature anglaise a fait faire un grand pas à cette branche de l'entomologie et de plus elle nous donne un exemple à imiter sous le rapport de la méthode, de la clarté et de l'esprit d'observation. Tout ce que Tutt a écrit au sujet des *Nepticula* dans son ouvrage, *British Lepidoptera*, est à lire. Cette lecture est le moyen le plus rapide de s'assimiler presque tout ce qui a été publié en cette matière et c'est pour avoir négligé cette lecture que des entomologues se sont parfois donné beaucoup de peine pour chercher à découvrir ou à élucider ce qui était découvert et tranché depuis quelque temps. Les difficultés inhérentes à l'étude des *Nepticula* s'atténuent ou disparaissent par la pratique et c'est le cas de rappeler cette consolante vérité, évocatrice de brillantes promesses: 'Nihil mortalibus arduum est, sed carpe diem?'"

As we are nearing the end of another volume of *The Natural History of the British Butterflies*, we should be very glad if any of our readers would send us detailed information of any errors or omissions that have been noticed in Parts 1-17, which have been already published. It is difficult to eliminate all such from so great a mass of detail, but each helper who looks over his own (and other) contributions, etc., may find some item that may be put right in a list of "Errata" in the last number. There must be at least 23 parts instead of 20 in this volume owing to the extended account of *Celastrina argiolus*, due to the recent discovery by Dr. Chapman and Mr. G. T. Bethune-Baker, that the whole of the American *Celastrinids*, and at least three supposed Indian species, are merely forms of our British species. Some 30 plates, including full life-histories of each species dealt with, by Messrs. Main and Tonge, and a large number (about 36) of structural photographs which Mr. F. Noad Clark has made from the preparations of Dr. Chapman, and which the latter has given us for reproduction, will make this the most comprehensive and most completely illustrated of all the volumes of the series yet published. The life-histories of all our "hairstreaks," of *Lampides boeticus* and *Celastrina argiolus*, have been worked out completely and *de novo*, and their various forms in different parts of the world described. For the first time an accurate detailed account of all these species has been completed, and errors, copied and recopied in the works of various continental entomologists, as well as by Newman, Barrett, South, and in our own small volume of "British Butterflies," published in 1896, have been corrected, and we hope cleared up finally. At any rate, we should be glad to know of any slips that any of our entomological friends have noticed, so as to make the contents as accurate as possible.

Oberthür, in the *Bull. Soc. Ent. France*, nos. 19, 20 (1907), has named some new species and interesting local forms taken last summer in Algeria by Mr. Powell. Among others, *Catocala sponsa* var. *laeta* and *C. promissa* var. *hilaris*, will be interesting to British lepidopterists.

Microlepidopterists also may be glad to have their attention drawn to Demaison's note on "*Acrolepia granitella*" and Joannis' account of two new species of *Nepticula*, viz. (1) *N. erythrogenella*, the larvæ mining bramble leaves from September to the end of November, and the imagines appearing from June 8th to July 22nd. The imago with two non-metallic separate spots; (2) *N. spinosella*, the larvæ mining the leaves of sloe (prunellier) from early September to the end of October, the imagines appearing from June 21st to July 10th, and being probably double-brooded. The differences between the mine of this and those of *N. plagicolella* and *N. spinosella* are pointed out; whilst the imago is compared with that of *N. plagicolella* only. It is said to belong to the *rubicora* and *arcuatella* group (*op. cit.*, pp. 326-329). Joannis also notes (p. 341) the larvæ of *Acalla schalleriana* as doing great damage to azaleas at Bruges.

We hear that Mr. Verrall's second volume of "British Flies" is in the printer's hands, and will be published this year; it will deal with the families *Stratiomyidae*, *Leptidae*, *Tabanidae*, *Cyrtidae*, *Bombyliidae*, *Therenidae*, *Scenopinidae*, and *Asilidae*, including some of our largest and most conspicuous species of Diptera. The general arrangement will be the same as the previous volume, on the *Platypezidae*, *Pipunculidae*, and *Syrphidae* published in 1901, but the catalogue at the end will be replaced by a list of the Palearctic species arranged systematically. We have no doubt the appearance of this volume will be cordially welcomed by many of our readers, and the list will, one suspects, be especially valued by students both in Britain and abroad.

It seems only a short time ago since Professor A. R. Grote left America, settled down at Hildesheim, and quite revived the Roemer Museum, producing a series of brochures of great interest to lepidopterists. Since his death, we have heard nothing of the work of the Museum, but now there comes to hand, dated December, 1907, another booklet, "Die Schmetterlingsfauna von Hildesheim," by Wilhelm Bode, dedicated to his highly esteemed teacher and friend, Prof. A. R. Grote, *i.e.*, with exactly the same title as No. 8 of Grote's series, dated 1897. The list has some systematic value, and contains some of the more recent changes of nomenclature. Other details, however, long since cleared up, are not varied from the list of 10 years ago. The number of misspellings in the generic names appears to be greater than usual in such publications.

BITUARY.

Ye dead, that live again
In that, ye leave behind,
Well knew that labour spent
Enriching other's mind,
Would leave us, too, 'mid grief untold,
A precious gift, more prized than gold.

Arthur John Chitty, M.A., F.E.S.

Born May 27th, 1859. Died January 6th, 1908.

We were able to notify last month, just as we were going to

press, the regrettable decease of our highly-esteemed and deeply-loved colleague, Arthur John Chitty. He was the eldest son of Sir Joseph W. Chitty, a Lord Justice of Appeal, and was born on May 27th, 1859. Educated at a private school till he went to Eton, in September, 1872, he there made excellent progress, and, when he left, in July, 1878, was head of his House and in the VIth Form. In 1877, he was in the Cricket and Football Elevens. Although at Oxford he occasionally kept wicket for the University, he never played against Cambridge. At football he was unlucky, for, though selected to play in the Inter-Varsity Association match of 1878, he was prevented by an injury from doing so. In that year, however, with his brother, Mr. J. H. P. Chitty, he helped to win the double Fives match for Oxford. He rowed in his College Eight (Balliol), and was for many years Secretary, and subsequently Treasurer, of the All England Lawn Tennis Club. At Balliol he was in residence from 1878-1882, taking a First in Honour Moderations (Classical), in 1880, and a Second Class in the Final School of "Litteræ Humaniores" in 1882. For a time he was greatly interested in astronomy, and constructed his own reflecting telescopes whilst he was engaged in the study. He was also an accomplished violinist. On leaving Oxford he entered as a student at Lincoln's Inn becoming in due course, Barrister-at-Law.

His interest in natural history dates back to 1869, when, as a youngster, he collected butterflies; but a deeper interest in entomology was awakened by reading Lubbock's "Bees and Ants" during his Eton days, and more definite observations took the place of the early desultory collecting. His first serious attempt at making a collection was, however, in 1883, when he captured a large number of coleoptera in North Wales, and thence onward, in the Long Vacation, when at the Bar, between 1883 and 1894, he devoted the leisure of his holidays entirely to collecting. In June, 1894, he married the daughter of Sir John Croft, Bart., but still his leisure was entirely devoted to collecting—and lepidoptera, coleoptera, hemiptera, hymenoptera, etc., all had their share of his attention, although he was, of course, first and foremost a coleopterist. He was an excellent field-worker, keen, observant, and patient in following up anything once he had directed his attention to it. In addition, his excellent education made him a first-class student, and so his intuitive observational powers, coupled with his ability to unearth and thoroughly digest the literature of his subject, made everything he wrote especially valuable. He was elected a Fellow of the Entomological Society in 1891, served as a member of the Council from 1902-4, and again from 1906 till his death, during which two periods of service, he was never absent on a single occasion, down to the time of his last illness, and which ended in his unexpected decease. He was a regular attendant at the ordinary meetings, keenly interested in the exhibits made and in the discussions arising therefrom, as well as in the ordinary business affairs of the Society. He was elected one of the "Eight" members of the Entomological Club, and the annual "supper," to the Club members and friends, at Hereford Square, was always a huge success. In order to have a representative on the Editorial Staff of the *Entomologist's Record*, capable of dealing skilfully with questions relating to the less-known orders—hymenoptera, hemiptera, etc.—

which sometimes arose, he was persuaded by the rest of the staff to join us, and his extreme carefulness made him a most valuable colleague. Affable, genial, and urbane, as well as a man of great intellectual culture, he was recently described by Mr. Verrall, the nestor of the Entomological Club, as an ideal member—generous, hospitable, kind—and we who knew him best can well endorse these sentiments, for he was a man of high and lofty character, generous and impulsive instincts, who made friends everywhere, and who will be missed alike by the collectors who hunted with him, and the students who worked with him. His great success in his profession left him with comparatively little leisure, but the careful work he has left scattered through the pages of the *Entomologist's Monthly Magazine* and *Entomologist's Record*, will remain a tribute to his unflagging energy and untiring industry. His last important note, the review of Morley's second volume *Ichneumoninae*, was written when the fatal complaint that carried him off had evidently strong hold of him, and his ill-health at the November meetings of the Entomological Society, was only too patent to everybody. Still none of us had then a suspicion that his end was so near. But his recovery was not to be, and we can now only offer this all too weak tribute to the memory of our revered colleague, coupled with our sincerest sympathies to the gentle lady, whom Fate has so ruthlessly left a widow and her children fatherless.

Martin Jacoby, F.E.S.

Born April 12th, 1842. Died December 24th, 1907.

It is with the greatest regret that we have to record the death of Martin Jacoby, on December 24th, 1907, in his 67th year. Born at Altona, he settled in England when twenty years of age, and has since resided here. An accomplished musician, he was a member of "Hallé's" band, and later of the orchestra of the Royal Italian Opera, and we, who have been accustomed to meet him at social entomological functions, have especial cause to mourn his loss, both on this account, as well as because of the great blank he leaves in the rank of our coleopterists. For some years he has been on the editorial staff of the *Entomologist*, became a Fellow of the Entomological Society of London in 1886, etc., was for some years a Member of the Council, and has enriched the *Transactions of the Entomological Society of London* with many papers on the Phytophagous Coleoptera. He was the author of the volume on the "Phytophaga" in the *Biologia Centrali-Americana*; and his volume on the same subject in the *Fauna of India*, was just completed (in print), though not published, at the time of his death. His collection of this group passed, some years since, into the hands of M. René Oberthür. He was slightly interested in British lepidoptera, but his knowledge of this order was of the slenderest, and the modern theories in explanation of the phenomena of "Mimicry" in insects, always found in him a most uncompromising opponent. His death, coupled with that of A. J. Chitty, cast quite a gloom over the proceedings for a short time at Mr. Verrall's annual supper to the members of the Entomological Club and their friends, on January 14th, for he had, for many years past, generously given of the best that his musical repertoire commanded, at this function, and charmed and delighted, year after year, the company, who were not only his entomological, but often his most intimate, friends.

H. Guard Knaggs, M.D., F.L.S.*Died January 16th, 1908.*

We regret to have to record the death of Dr. H. Guard Knaggs, at Folkestone, on January 16th, in his 75th year. During the "sixties" of the last century he was an energetic collector, devoted to field work, but without any pretensions to the scientific side of entomology. As one of the editorial staff of the *Entomologist's Monthly Magazine*, for the first ten years of its existence, he showed considerable energy in dealing with the collectors' side of entomology, and also compiled for a time for the *Entomologists' Annual* the list of rarer Macro-lepidoptera captured during the year. Suddenly, in 1874, he withdrew from the entomological world, notice appearing in the *Ent. Mo. Mag.*, xi., p. 1, that "increasing professional duties compelled him to withdraw from his editorial connection with the magazine." The accumulation of his field-knowledge, and that of his friends, trifling as it may appear to-day, was collected into the little booklet known as "*The Lepidopterists' Guide*," and, almost in its primitive form, it still maintains a vogue among the beginners who annually join our ranks. After 20 years' absolute silence entomologically, Knaggs came back to his "first love," and, in various ways attempted to regain his position in the entomological world, vacated 20 years before, but his entire want of knowledge of what had been done in the interval, his ignorance of the scientific tendency that had almost unperceived, because so automatically, developed during that busy period, and now pervaded the subject, left him stranded. He did not realise that the old order had changed and given place to new, and so, out of touch with modern thought, too advanced in life to accommodate himself to modern lines, and, at last, in such bad health that he was a permanent invalid, his interest in entomology became practically nil. One regrets that with so much vigorous capacity he has not left a more lasting mark on entomology, but probably he would himself have chosen to have lived again in the spirit of his *Guide*, and obtained a keener sense of enjoyment in the knowledge that the youngsters would, for a time, at least, use his book, than if he had made a permanent contribution for all time to our favourite science.

Nicholas Frank Dobrée.*Died January 8th, 1908. Aged 77.*

It is with the greatest regret that we have also to record the death of Nicholas Frank Dobrée, of Beverley, on January 8th, at the age of seventy-seven. As he himself once said, his "amusement consisted in collecting specimens of our insular Noctuæ from different parts of Europe," and his valuable collection has been presented to the Hull Museum. He certainly knew a great deal about this part of the European fauna, but his contributions to our entomological literature were very limited. For some years, whilst we were engaged on the volumes of *The British Noctuae and their Varieties*, we had considerable correspondence with him, and always found his careful remarks of considerable value, whilst, about the same time, he became much interested in the phenomena of melanism and melanochroism as exhibited in his favourite group of moths. As an ex-President of the Hull Field Naturalist's Society, and an active member of the Yorkshire Naturalist's Union, he will be greatly missed by a large circle of Yorkshire friends.

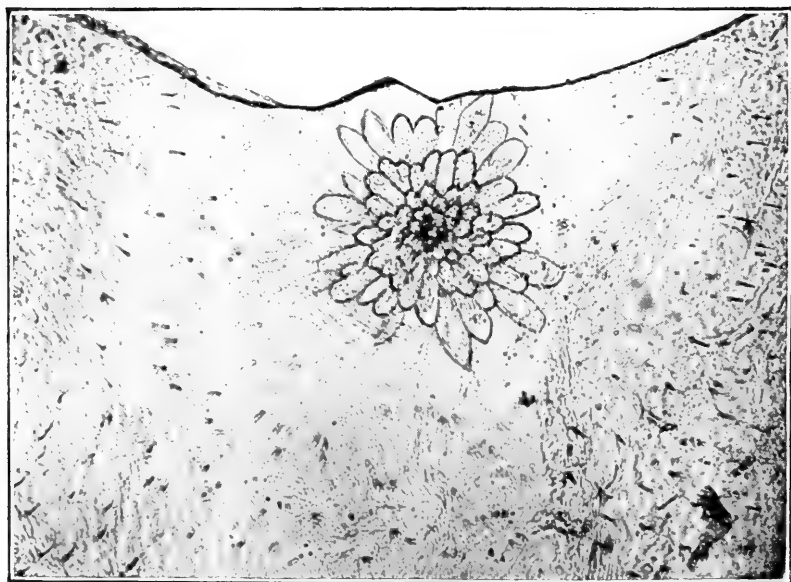
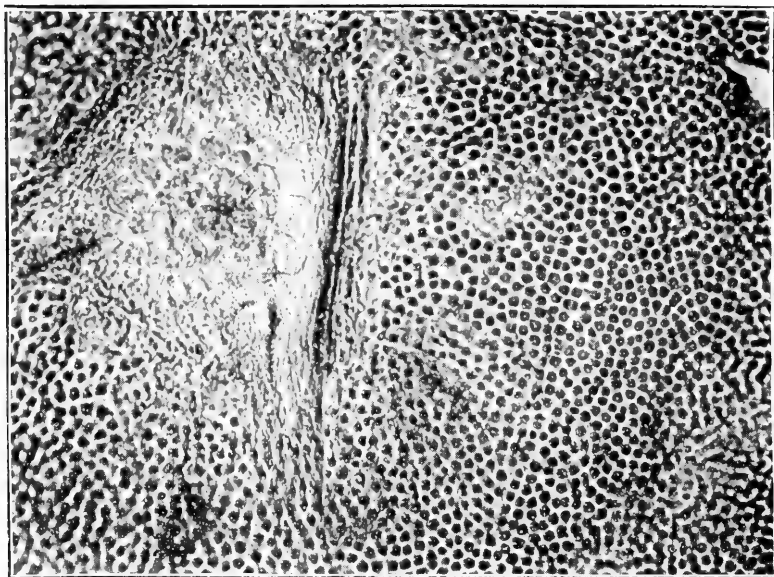


Photo. F. N. Clark.

1. MICROPYLAR AREA OF EGG OF *CYCLOPIDES SYLVIUS* $\times 250$.
2. MICROPYLAR AREA OF EGG OF *ADOPÆA FLAVA* $\times 250$.



2.

1. GENITALIA OF *MARASMARCHA TUTTODACTYLA*, CHPM.
(FIG 1 \times 40. FIG. 2 \times 45.)

The Lepidoptera of Ticino—Airolo.

By J. W. TUTT, F.E.S.

The idea of making Airolo a centre for entomological excursions, originated a long time ago. A well-known entomologist whose peregrinations in Switzerland have extended close on half a century, had often held out the delights of the lovely canton Ticino, and my own observations, carried out one memorable day of sun and snowstorm in April, 1903, reawakened the notion that one day one ought to stay there. If the weather be fine, said my friend, go up the Pass—up, up; if it be bad take a ticket down to the lakes and find the fine weather. What could be more alluring? So here, in the mid-afternoon of August 1st, 1907, I find myself at Airolo.

Airolo is a small town on the Italian side (if it can be said to have an Italian side, where both sides are Swiss) of the St. Gothard Pass, at 3865ft. elevation, and so corresponding with Göschenen or Andermatt on the northern side. The train no sooner leaves the tunnel under the St. Gothard on the south side before one finds oneself in Airolo railway-station, with an abundance of satisfactory accommodation directly outside. But, simple as it looks on paper to work Airolo, one does not find it as easy as, for example, at Göschenen, where the houses are built on ground stolen a few years since from the butterflies, for Airolo is an old and important village, that has existed for a long time on the main road over the St. Gothard Pass, well-cultivated for some distance round, and one can expect little until one has moved at least one or two miles from the town precincts.

The afternoon sun was shining up the Val Bedretto, so, as soon as the impedimenta had been safely deposited in a room taken, I wended my way with zinc box and net, and a few "glass-bottomed boxes," towards this attractive-looking spot. On the way, I noticed the poplar trees in the streets, and the willows down by the river, almost stripped in some places, and the partially-eaten leaves fastened into puparia by the larvæ of *Leucoma salicis*; eggs, larvæ, pupæ and large numbers of imagines, many newly-emerged, were there, mostly, it struck me, rather small, compared with those one used to get at Deal 20 years ago. However, a sharp walk over the bridge and up the road on the way to the valley soon showed that my supposition that the Val Bedretto would produce lepidoptera was well-founded, for the scabious and other blossoms by the roadside were festooned with plenty of fine large examples of *Anthrocera lonicerae* var. *major*, certainly going over, though still many were fine enough to give a "good" example, whilst *Anthrocera transalpina*, also of large size, was apparently just emerging. A very fine example of *A. lonicerae* ab. *achilleae*, Hb.-Gey. (= *confluens*, Sélys) was among the spoil. A little further on several *Pararge maera* were seen, and many *Erebia ligea* flitted up among the trees on the bank rising from the river, now far below, to the path along which we were rapidly ascending. Both species, however, were in poor condition, and one had to net several before one was able to get two or three as geographical types fit for the collection. *Gnophos obfuscata* stuck to the stone walls, although one or two were noticed on *Centaurea* flowers, whilst *Crambus conchellus*, *Scoparia* sp.?, and an *Adkinia* were also disturbed and netted. *Agriades corydon* was

MARCH 15TH, 1908.

flitting about quite freely, although it had not been noticed on the other side of the Pass, the ♀s with a tendency to blue scaling on the hindwings. Then we found a sunny corner, where a steep, stony, torrent-bed had been torn out, down to the river, and the rough sides were covered with willows, birches, and little poplars, and here was real destruction, for the larvæ of *Leucomasalis* had, in some cases, absolutely stripped the willows and poplars, and hundreds were flying everywhere, whilst the spittle-like covering of their eggs was seen on the stems, leaves, and stones, almost everywhere. But I was more interested in the fact that some small fritillaries were flying freely, and, netting them, I found them to be *Brenthis amathusia*, *Melitaea dictynna* and *Melitaea athalia* (?), the mountain form; but oh, how disappointing it was, for all the species were *passé*, and specimen after specimen was captured only to be rejected. More than a half-hour was spent on them, and the total results were 9 *M. athalia*, 2 *M. dictynna* and 2 *B. amathusia*, just good enough to take, in spite of the fact that, as they swung in the afternoon sun on the scabious flowers, they really looked quite lovely. However, a closer inspection proved that our standard for cabinet purposes was higher than their condition, so we had to let them go. A thought of moving on drew attention to the fact that the sun had left the road in the upper part of the valley, and so we lingered a little longer and returned, feeling that, so near the town, and so low down, the season already appeared to be over.

(To be continued.)

Notes from the Pyrenees (with three plates).

By T. A. CHAPMAN, M.D.

I spent, last summer, a few weeks in the central Pyrenees, chiefly at Gavarnie. In visiting them the principal object I had in view, was to observe *Erebia lefevrei*.

The Pyrenees are not visited by English entomologists in any numbers, yet they are as accessible, and entomologically as attractive, as, say, the much more frequented Switzerland or the Tyrol. Accessible must, however, be taken *cum grano*, there is no difficulty in getting there, but suitable resting-places, except at the lower levels, are much fewer. Anything, however, I might have to say, either about travelling in these mountains, or their general entomological features, is said so much better than I could do it by Mr. H. Rowland-Brown in the *Entomologist*, 1905, p. 243, that I will confine myself more particularly to a few special items in which I was interested.

MARASMARCHA TUTTODACTYLA, Chapman.

Marasmarcha tuttodactyla is abundant at Gavarnie and other places, near Luz, Gedre, etc., and is probably common in the south of France. Monsieur Rondou knows it as *M. phaeodactyla*, and there can be little doubt that it is not distinguished from *M. lunaedactyla* (*phaeodactyla*) by French entomologists, and the two species together form in their minds, books and descriptions, their pictures of *M. lunaedactyla*. The distinction between the two species is unmistakable when the ancillary appendages are examined, those of *M. lunaedactyla* being symmetrical, of *M. tuttodactyla* different on the two sides. Mr. E. R. Banks has been kind enough to examine a short series of *M. tuttodactyla*, and to give me a description of the points in which it differs from *M. lunaedactyla*.

He says "about 60 *M. lunaedactyla*, some bred, some caught, have been used for the comparison.

To my eye, *M. tuttodactyla* differs from its ally in the following points:—

(1) Its ground colour is apparently more variable in tone, appears to be much less uniform owing to points 2, 3, and 4.

(2) It has an oblique whitish bar across the outer half of the upper lobe, and often a similar, though less well-defined, bar across the outer half of the lower lobe of the forewing. If ever present, these markings are exceedingly rare in *M. lunaedactyla*, I have only one reputed *M. lunaedactyla* that shows them; it stood in a British collection, but without data, and I now suspect that it came from the continent, and is *M. tuttodactyla*. It has been repinned.

(3) The dorsal margin of the forewing tends to be strongly, though irregularly, marked with white from below the end of the cleft inwards. This tendency is much stronger than in *M. lunaedactyla*.

(4) Both lobes of the forewing have the outer half of the upper cilia more or less distinctly whitish. This is not the case in *M. lunaedactyla*.

(5) It has the antennæ rather lighter and more conspicuous than *M. lunaedactyla*, owing to the white rings being broader than in the latter species, and the dark ones consequently narrower."

One might readily set down these differences as the peculiarities of a pale southern race were it not for the remarkable distinctness in the appendages.

At Gavarnie its foodplant is *Ononis natrix*, and it does not touch an *Ononis* that I could not distinguish from our common *O. arvensis*. M. Rondou says, nevertheless, "larva on *Ononis repens*" (but printed *reptans*) (a synonym of *arvensis*, and, doubtless, the species I observed). I fancy, however, that the record is not from his own observations, but quoted from accounts of *M. phaeodactyla*. In Dauphiny, Mr. Tutt found it amongst *Ononis cenisia*. It is clearly a comparatively southern and hill form, whilst *M. lunaedactyla* is a more northern species, affecting, however, lower ground.

The precise relationship of *Marasmarcha tuttodactyla* will be more clearly appreciated by a reference to the figures of the ancillary appendages of all the species of *Marasmarcha* I have so far been able to examine.

The genus *Marasmarcha*, entirely apart from these appendages, occupies a special position amongst the plumes; whether its larval, pupal or imaginal character be taken as guides, it is difficult to say whether the genus belongs to the Platytiliid or Alucitid (Aciptiliid) divisions, to one or other of which nearly all other genera (Agdistids apart) are easily referred. There can, in fact, be no doubt that it occupies an intermediate position between the divisions. This determination is amply confirmed by a reference to the ancillary appendages.

The Platytiliids have these organs symmetrical, and the clasps are simple. The Alucitids (Aciptiliids) have the clasps on either side different from the other, and an armature usually somewhat like a hair or bristle. In the figures of *Marasmarcha* herewith, it will be seen that all have a hairlike armature, and, of the six, three are symmetrical and three are asymmetrical. The asymmetry affects, however, only the bristles (the especially Aciptiliid feature) and not the bodies of the clasps.

The appendages of *M. lunaedactyla* are the most difficult to mount fully displayed of any I know, the one photographed is perhaps as

successfully done as any I have mounted, but even in it, the hairs on one side have been disturbed in the process, and give an erroneous impression of differing from those on the other. In *M. lunaedactyla* the appendages are quite symmetrical, the two hairs which each clasp carries have the appearance of being a disc or medal sunk into the middle of the clasp, as they are curved round into a circle. In *M. tuttodactyla*, the whole appendages are smaller than in *M. lunaedactyla*, and the hairs on one side are not very dissimilar from those of that species, but are shorter and do not make a complete circle, and, on the other side, they are very short and straight. A vastly greater difference than one would expect to find in two imagines that resemble one another so closely. *M. tuttodactyla* is very close indeed to, if not identical with, *M. agrorum*, and I think the differences seen in the figures come within the limits of variation due to geographical (climatic or other) causes, that may occur in races of one species. Allowance has to be made in the figures for the hairs having been more completely removed in mounting the specimen of *M. tuttodactyla*, and a difference in the pressure used. I have only the one specimen of *M. agrorum*, but some specimens of *M. tuttodactyla* approach it more nearly than those figured. I incline, therefore, to believe that *M. tuttodactyla* is probably a race of *M. agrorum*, but am not at all positive about it. The appendages of *M. fauna* (from the Riviera) form a very elegant object, the hairs are highly curved but far from forming a circle. The clasps are quite symmetrical.

The other two are on a much larger scale, both are from specimens obtained from Staudinger, one under the name of *Platyptilia asiatica*, is unquestionably a *Marasmarcha*, and has very large curled bristles. It is quite symmetrical, the appearance to the contrary is due to one of the clasps being turned over. The clasp of the other, *M. colossa* probably points to generic separation from *Marasmarcha*. The hairs long and curled on one side, very short and straight on the other, are, of course, typically Marasmarchid, associated as they are with clasps otherwise symmetrical. But the spines on the clasps differentiate it from the other species. As regards dividing the Marasmarchids into several genera, the difference between *M. lunaedactyla* and *M. tuttodactyla*, as shown in the clasps, is that between not two genera, or two tribes, but between the subfamilies of Platyptiliids and Alucitids (Aciptiliids), yet the imagines are so close as to have long escaped recognition of their being distinct, and are, unquestionably, very closely related to each other, and we must admit that what for the mass of "plumes" is a difference of subfamily importance, here has a value involving only specific rank.

In comparing the larvæ of *M. tuttodactyla* and *M. lunaedactyla*, one finds that the resemblances are extremely close, and the differences are, in fact, in degree, not in kind. The hairs of *M. tuttodactyla* are rather thicker and much paler than in *M. lunaedactyla*, and the accessory postspiracular tubercle is always well-developed, always having three, and often four, hairs. On the same tubercle in *M. lunaedactyla*, even four hairs sometimes occur, but, as a rule, one finds only two, and a solitary hair is not uncommon. The larvæ is also decidedly paler.

The pupæ are again extremely similar, but there are some differences in the outline of the halbert-shaped dorsal spines. It would be difficult to assert these to be more than varietal, and they do not lend

themselves easily to description ; there is, however, at least one difference that is fairly entitled to specific rank. On the 2nd abdominal segment there is, in *M. lunaedactyla*, a strong hook, rising up above the anterior hair, and giving the armature of this segment much the same character as that on the 4th and following segments. In *M. tuttodactyla* there is no such hook, the armature is wanting much as in the 1st abdominal segment. In one specimen I found a slight projection here, and, in a few *M. lunaedactyla*, the hook is a little less developed, but there is still a gap between those specimens that most approach each other. The pupa of *M. lunaedactyla* is often green, I do not think I found one of *M. tuttodactyla* of that colour, on the other hand, they varied from pale grey to absolutely black, not a few being of that tint. I do not remember ever to have seen a black pupa of *M. lunaedactyla*, though some are fairly dark. It may be noted that the pupa of *Stangeia* (Tutt) *siceliota*, on *Ononis natrix*, varies from pale to quite black. [By the way, I can find "*Stangeia*"* nowhere but in Tutt's *British Lepidoptera*, vol. v., p. 492, where it occurs in a quotation from me, but placed there by Mr. Tutt, not by me.] I quite agree, however, that *siceliota* is abundantly distinct generically from *paludum*.

PLATE VI.

PHOTOGRAPHS OF TWO SPECIMENS OF ANCILLARY APPENDAGES OF *MARASMARCHA TUTTODACTYLA* $\times 45$.

FIG. 1.—On slide (and compressed) laterally.

FIG. 2.—Opened out, and dorsal portions separate. In fig. 1, the two hairs are seen coiled round on one clasp ; on the other, the short, straight hairs, directed across (apparently, in the flattened specimen) to those of the other side, are not very apparent at first view ; the vacancy in the area, that is occupied in the other clasp by the circling hairs, is very obvious, as it is also in fig. 2, in which the two short hairs are lying along the axis of the clasp.

PLATE VII.

FIG. 1.—Ancillary appendages of *Marasmarcha agrorum* $\times 18$.

FIG. 2.—Ancillary appendages of *M. tuttodactyla* $\times 18$. Allowing for the slightly different attitudes of the specimens, the differences between figs. 1 and 2 are slight ; the more robust shaft of the clasp in *M. agrorum* is, apparently, a real difference. *M. tuttodactyla* is seen better in pl. vi.

FIG. 3.—Ancillary appendages of *Marasmarcha fauna* $\times 18$. These are symmetrical, but smaller and more delicate in structure than those of *M. lunaedactyla* (pl. viii., fig. 3) ; the two hairs are not held down in a hollow, into an exact circle as in that species.

PLATE VIII.

FIG. 1.—Ancillary appendages of *Marasmarcha asiatica* $\times 18$ (forwarded by Staudinger as *Platyptilia asiatica*). One clasp is folded over, so as to make the very bold double hairs appear to curve in different directions in the two clasps ; they are, however, quite symmetrical.

FIG. 2.—Ancillary appendages of *Marasmarcha colossa* $\times 18$. The double hairs are asymmetrical ; the short hairs on left clasp well shown ; the spurs on clasps appear to entitle this species to separate generic rank.

FIG. 3.—Ancillary appendages of *Marasmarcha lunaedactyla* $\times 18$. This fig. shows the double circular hairs, symmetrically placed in each clasp ; the appendages are decidedly larger and more robust than in *M. tuttodactyla* or *M. fauna*.

* This is so. *Stangeia* was created for *siceliota* to separate it generically from both *Buckleria* and *Trichoptilus*. It was intended to deal with this in *Nat. Hist. Brit. Lep.*, vol. v., but was quite overlooked. It is a very distinct genus, with type *siceliota*.—ED.

Swiss Butterflies in 1907.

By DOUGLAS. H. PEARSON.

The morning of June 23rd, 1907, found us at Sierre, with quarters at the very comfortable "Chateau" Hotel, as a starting-point for the Val d'Anniviers. A short stroll towards Chippis produced a few common things, but among them two specimens of *Melitaea deione* var. *berisalensis*, though I am free to confess that, at the time of capture, I mistook them for *Melitaea athalia*, and it was only on setting them that they were seen to be something new. Two more were taken on the 25th on the zigzag road above Chippis; they are in fair condition, but one has a dwarfed hindwing, which seems rather common in this family. Mr. Prout has kindly identified the insect, and the occurrence here is very interesting, as Mr. Wheeler gives Martigny and Saillon as the only known localities ("reported from Varen") (see *antea*, xvi., p. 17), but possibly this is another case of the distribution of an insect being the distribution of collectors.

On the 24th, and morning of the 25th, we worked near Chippis, along the railway-banks, and the end of the Pfyn Wald, and took two or three *Polyommatus escheri*, some *Issoria lathonia* in fresh condition, one specimen of *Strymon pruni*, half-a-dozen *Pontia daplidice*, and a nice series of female *Plebeius argyrognomon* from the riverside near Chippis. Here we found what, to me, was quite a novelty—mistletoe growing on fir-trees, but, in the Val d'Anniviers, it was very plentiful. I had always imagined that it was entirely confined to deciduous trees, and a botanical friend said that the fact that it would grow on fir was quite new to him. In the afternoon we moved up to Vissoie, but a careful look out on the rocks failed to turn up *Hipparchia alcyone* or *Satyrus circe*, though *Pararge maera* was not uncommon.

On the 26th we walked over to the village of Pain Sec, and took one *Hipparchia alcyone*, a few *Heodes* (*Chrysophanus*) *virgaureae*, and *Chrysophanus hippothoë*, and some dark brown females of the var. *eurybia*, with intermediates between this and the type. *Euanessa antiopa*, in very fair condition for a hibernated specimen, was also captured, and *Aricia eumedon*, *Cyaniris semiargus* ♀s, and a few other things, helped to make a bag. The next day we went up to Zinal and met with a few good things. In the wood near the chapel of St. Laurent *Cyclopides palaemon* was quite plentiful, and half-a-dozen were boxed in almost as many minutes, but we did not manage to find *Polyommatus donzelii*. The best capture was *Melitaea maturna* var. *wolfensbergeri*, four of which were taken settled upon the road, but no more could be found in the meadows near, though they yielded a solitary *Polyommatus pheretes*, and one *Erebia mnestra* was taken in this wood. One *Loweia* (*Chrysophanus*) *alciphron* var. *gordius* was also taken, but it was scarce in the valley, and only three or four were seen round Vissoie during a week's stay, one ♂ having a very strong purple suffusion. In the meadows between Vissoie and Grimnetz, *Brenthis amathusia* was common and in fine condition, two specimens being very strongly marked on both upper- and undersides of the forewings, the spots running together to form a black patch. *Brenthis ino* and *B. dia* were also taken, and a nice aberration of *Aglais urticae*, in which the yellow spots on fore- and hindwings are replaced by the red of the ground colour. *Melitaea phoebe* was also common and variable, the var.

occitanica being almost equal in numbers with the type. One aberration of the underside is very noticeable, the broad white band of the hindwings being replaced by yellow, and the line which borders the antemarginal band is so much strengthened as to become a narrow black band, while, on the forewings, the usual black markings are almost entirely absent.

Close to the river at Vissoie, one *Polyommatus donzelii* was taken, while a dry bank near the bridge leading to the Weissshorn produced *Hipparchia alcyone*, *Satyrus cordula*, *Powellia sao*, and *Melanargia galathea*. The meadows were alive with *Heodes virgaureae*, but males only, and on returning a week later still no females could be found. A few *Polyommatus hylas* were taken and two *Lycaena alcon* (worn), while *Agriades corydon* and *Erebia ceto* were plentiful. *Lycaena arion* was not common, and mostly of the var. *obscura*, but one or two very brightly marked specimens were netted, and two *Celerio gallii*, flying round the flowers in the hot sunshine.

The Weissshorn Hotel (7694 feet) was our next objective, and we walked up on the morning of July 1st. A few *Melitaea aurelia*, two very dwarf *Brenthis euphrosyne*, and *Erebia gorge*, were the principal things noted on the way up. The evening was wet, but the morning showed a very different picture, as six or eight inches of snow had fallen during the night, and the whole country round was white well down to the tree limit. Practically nothing could be done for the next two days, but, under the warm sun, the snow soon began to melt, and a walk towards Chandolin produced *Colias phicomone* and *Anthocaris simplonia*, while one *Melitaea cynthia* was seen but not taken. A fine walk on July 5th along the mountain-path towards Zinal, produced a few more *Erebia gorge*, five *Polyommatus orbitulus*, and one *Erebia melampus*. After waiting in vain for a suitable day, we walked up Bella Tola (9845 feet) on the 8th, beginning the ascent by losing our way in a thick mist, which entailed some rough scrambling before the path was struck. The view was, no doubt, there, but was not for us, and a hailstorm on the summit turned to heavy snow, which soon covered our tracks and made the return journey neither easy nor pleasant. It was curious the next morning to leave the country again deep in snow, and within half-an-hour to be catching butterflies in the meadows below the snow-line, on the way to Vissoie. These included one *Plebeius optilete*; and the bank at Vissoie now produced plenty of *Hipparchia alcyone* and *Satyrus cordula*, with a sprinkling of the brown ♀ of the latter—which Mr. Wheeler does not very clearly describe. *Polyommatus damon* was just coming out, and, in the meadows between Vissoie and St. Luc, five or six were taken, including one ♀. On the 11th we walked down to Sierre, taking one *Polyommatus escheri*, one *Epinephele lycaon*, one *Erynnis lavaterae* and other things on the way; one *Dryas paphia* was seen but not bagged. All the ground covered seemed to be very good, and insects abundant. Possibly the very late season had held many things back, and these, coming out with the later species, made the country seem especially rich. I fear that the hotel proprietors would not find it a rich season. At the Weissshorn Hotel the total muster of guests for a week was four, and the excellent chef certainly deserved a better gathering to appreciate his efforts.

Euplectus bescidicus, Reitt.: A New British Beetle.

By NORMAN H. JOY, M.R.C.S., F.E.S.

A short time ago Mr. C. J. C. Pool sent me for identification an *Euplectus*, which he was unable to name, as it was not represented in the Power collection. It proved to belong to the section of the genus which is distinguished by having the raised border on each side of the depressed area, in the middle of the base of the two first visible dorsal segments, reaching, at least, to the middle, and which contains the two British species—*E. kunzei*, Aubé; and *E. duponti*, Aubé. From the description of the ♂ characters I identified it as *E. bescidicus*, Reitt., and was able to confirm this by comparing it with a specimen of this species in the Bates' collection (kindly lent to me by Mr. Donisthorpe), which had been identified by Herr Reitter some time ago.

Ganglbauer compares *E. bescidicus* with *E. duponti*, from which it differs in being smaller (L. 1.5mm.); the antennæ are longer, the last joint especially so; the head is smooth between the frontal furrows; the central furrow of the thorax is shorter; the dorsal striæ of the elytra are shorter, and do not reach the middle; the two depressed areas on the abdomen are wider, occupying about one-third of the breadth of the segments; and the ♂ characters are different. In the ♂ the ventral segments are flattened and the penultimate has a small fovea in the middle. The only locality given is "In den Beskiden" (Lissa Hora, Paskau).

Mr. Pool has taken five specimens at Enfield under fir bark, and one under elm bark. The two specimens in the Bates' collection are from Lawson's collection, taken by him at Scarborough.

Midland Myrmecophilous notes for 1907.

By H. WILLOUGHBY ELLIS, F.Z.S., F.E.S., AND A. H. MARTINEAU, F.E.S.

We have been working ants' nests together since March, 1907, and, although neither of us has had the leisure to work out the whole of our captures taken by this means, the following were certainly taken during the year just closed.

FORMICA SANGUINEA, LTR.—Several nests of this rare ant were found in thriving condition at Bewdley on April 1st. The occurrence of this species was recorded in the *Victoria County History of Worcestershire* and was taken as long ago as 1893; in addition to the usual *F. fusca* we found *Myrmica sulcinodis* and *M. scabrinodis* in the nests.

FORMICOXENUS NITIDULUS, MAYR.—This little species was found in great numbers, ♀s and ♂s, in nests of *Formica rufa*, at Knowle, in April, May, and June. It occurred chiefly in the driest parts of the nest, small portions as large only as a walnut, when broken open would yield upwards of a dozen specimens, and, in the latter months, larvæ and pupæ were plentiful. We were unable to work these nests later in the year, when the ♂s would occur. We have taken this species regularly now for some years past, but never so abundantly before. As pointed out by Mr. Donisthorpe, 1906 was a good year for this ant, and, in our experience, 1907 was even better. It is gratifying to find it so well established in the Midlands.

Coleoptera.—**OXYPODA FORMICETICOLA, Märk.**—Abundant in nests

of *Formica rufa*, March, April, May, June; Knowle, Bewdley. OXYPODA HÆMORRHOA, Sahl.—In nests of *Formica rufa*, April; Knowle. THIASOPHILA ANGULATA, Er.—Abundant in nests of *Formica rufa*, all seasons; Knowle, Bewdley. DINARDA MÄRKELI, Kies.—This beetle occurred in nests of *Formica rufa*; Bewdley, Knowle. DINARDA DENTATA, Gr.—This species has occurred abundantly in nests of *Formica sanguinea* in April, at Bewdley. It has not apparently been recorded from the Midland counties before. MYRMEDONIA HUMERALIS, Gr.—Found abundantly with *Formica rufa* on May 12th, running on pathways in tracks of the ants in bright sunshine, when they are very active. During the dull parts of the day they were not to be seen. Several other specimens were taken from time to time during this month and the beginning of June. We have never taken this beetle inside the nest, and it is apparently always found in the positions indicated. DRUSILLA CANALICULATA, F.—In nests of *Formica sanguinea*, April, May; Bewdley. NOTOTHECTA FLAVIPES, Gr.—Abundantly in nests of *Formica rufa*; Knowle, Bewdley. NOTOTHECTA ANCEPS, Er.—Taken with *Formica rufa*; Knowle. HOMALOTA NITIDULA, Kr.—Taken with *Lasius fuliginosus*; Knowle. It has been recorded with this ant before, but Donisthorpe is of opinion that they are chance visitors (*Proc. Lanc. and Ches. Ent. Soc.*, 1905). QUEDIUS BREVIS, Er.—In nests of *Formica rufa* and *F. sanguinea* at Bewdley, and with *Formica rufa* at Knowle. This species is generally associated with *Formica rufa* and *Lasius fuliginosus*. QUEDIUS MESOMELINUS, Marsh.—A specimen of this beetle was found in the nest of *Formica rufa* at Knowle. It had been badly injured by the ants, and was in a dying condition; Donisthorpe records taking it in plenty with *Lasius fuliginosus*, and, on introducing them into his observation nest of *Formica rufa*, they were immediately torn to pieces. They are probably chance visitors. XANTHOLINUS ATRATUS, Gr.—With *Formica rufa* and also *Lasius fuliginosus* at Knowle, and with *Formica rufa* at Bewdley. This is apparently the first British record of its occurrence with *Lasius fuliginosus*. It, however, occurs with this ant on the continent. LEPTACINUS FORMICETORUM, Märk.—Taken with *Formica rufa* at Bewdley and Knowle. Two specimens were taken in July at Knowle, which appear to be broader and more robust than the typical form. OTHIUS MYRMECOPHILUS, Kies.—Captured with *Formica rufa* at Knowle and Bewdley. PTENIDIUM FORMICETORUM, Kr.—In nests of *Formica rufa*; Knowle. DENDROPHILUS PYGMEUS, L.—In numbers with *Formica rufa*; Knowle. MYRMETES PICEUS, Pk.—In nests of *Formica rufa* at Knowle. MONOTOMA CONICICOLLIS, Aub., and M. FORMICETORUM, Th.—Both taken with *Formica rufa* at Knowle and Bewdley. CLYTHRA QUADRIPUNCTATA, L.—Larvæ and pupæ of this species were taken in nests of *Formica rufa* at Knowle.

Proctotrupidæ.—LAGINODES PALLIDUS, Boh.—In a nest of *Formica rufa* at Knowle, in July.

We have, unfortunately, been unable to give as much time to this subject as we at first hoped to do, but during the year we collected a large amount of material, which is gradually being worked out, and we hope to record species of other orders at a later date.

Synopsis of the Orthoptera of Western Europe.

By MALCOLM BURR, B.A., F.L.S., F.Z.S., F.E.S.

(Continued from p. 301.)

Genus II: UROMENUS, Bolivar.

This genus contains fourteen species, of which only two occur in Europe, but between these two there reigns great confusion. Serville originally described, under one name, forms from Sardinia and from the Pyrenees, but the characters he gives are common to the two forms. The synonymy is consequently very confused. We will follow Bolivar is retaining Serville's original name for the Sardinian species, and applying Bolivar's name to the Spanish species.

TABLE OF SPECIES.

- | | |
|-------------------------------------------------------------------------------------------------------------------------------------|------------------------|
| 1. Subgenital lamina ♀ with short triangular lobes;
cerci ♂ cylindrical, obliquely truncate at apex and
toothed there | 1. RUGOSICOLLIS, Serv. |
| 1.1. Subgen. lamina ♀ with attenuate triangular lobes;
cerci ♂ conical toothed at the base | 2. DURIEUI, Bolivar. |

1. UROMENUS RUGOSICOLLIS, Serville.

Green; pronotum very rugose, hinder margin with a broad triangular emargination. Length of body, 24mm. ♂, 28mm. ♀; of pronotum, 7.5mm. ♂, 8mm. ♀; of anterior tibiæ, 8mm. ♂, 12mm. ♀; of posterior femora, 21mm. ♂, 20mm. ♀; of ovipositor, 14mm. ♀.

Found in Sardinia (Serville), and Corsica (Mus. Vienna) and also in Algeria. The records of this species from southern France probably apply to the following species, although Finot refers them here.

2. UROMENUS DURIEUI, Bolivar.

Closely resembles the preceding, but the pronotum is much more smooth and convex; the anterior tibiæ are shorter, the cerci of the ♂ are longer: the lobes of the subgenital lamina of the ♀ are longer and more slender, and the cerci of the ♂ are longer and more cylindrical. Length of body, 31mm. ♂, 32mm. ♀; of pronotum, 8.3mm. ♂, 8mm. ♀; of anterior tibiæ, 9mm. ♂, 10mm. ♀; of posterior femora, 17mm. ♂, 17.5mm. ♀; of ovipositor, 12.5mm. ♀.

Fairly common in Catalonia; recorded by Bolivar from Tordera and Calella; taken by the writer at Vildarau, on Monseny near Barcelona; recorded by de Bormans from Béziers in southern France; also the records from Perpignan, Roussillon, Caraman (Haute-Garonne) and Toulouse probably refer to this species.

Genus III: STEROPLEURUS, Bolivar.

This genus consists chiefly of species inhabiting northern Spain, but there are some species in Italy and northern Africa.

TABLE OF SPECIES.

- | | |
|----------------------------------------------------------------------------------------------------|----------------------|
| 1. Metazona of pronotum very convex, with carinae
absent or almost obsolete. | |
| 2. Lower border of side flaps of pronotum straight;
supraanal plate ♂ round. (Ovipositor long.) | |
| 3. Cerci ♂ with a black apical spinule; Catalan
species | 1. CATALAUNICA, Bol. |
| 3.3. Cerci ♂ with only basal tooth; Italian
species | 2. CAVANNÆ, Targ. |

- 2.2. Lower border of side flaps of pronotum more or less distinctly sinuate; (supraanal plate σ variable).
3. Ovipositor twice as long as pronotum; supraanal plate σ rounded.
4. Italian species.
5. Sulci of pronotum black; anterior tibiæ unarmed; abdomen speckled; subgenital lamina with a shallow round emargination
- 5.5. Sulci of pronotum not black; anterior tibiæ sometimes spined; abdomen plain; subgenital lamina with deep triangular emargination 4. SICULA, Fieb.
- 4.4. Spanish species.
5. Cerci σ armed apically with sharp tooth placed obliquely and separated from the inner tooth by a furrow; metazona small, with big impressions, but not very deep
- 5.5. Cerci σ conical at apex; metazona large, very rugose 5. ORTEGAI, Pant.
- 3.3. Ovipositor two-and-a-half times longer than pronotum; supraanal plate σ angular.
4. Supraanal plate σ acutangular; Italian species
- 4.4. Supraanal plate σ obtusangular; Spanish species.
5. Pronotum very convex posteriorly, with no median keel, the lateral keels obsolete beyond the middle; subgenital lamina φ entire.
6. Pale 6. ASTURIENSIS, Bol.
- 6.6. Black and yellow 7. ANNÆ, Targ.
- 5.5. Pronotum nearly tectiform posteriorly, with faint median carina, the lateral carinæ extending to posterior border; subgenital lamina φ sinuate in the middle 8. STALI, Bol.
10. NOBREI, Bol.
- 1.1. Metazona of pronotum more or less oblique and tectiform, keeled centrally.
2. Last ventral segment φ smooth; supraanal plate σ longer than broad. Anal segment σ with hinder border straight, interrupted by median sulcus, but generally parallel with border of preceding segment.
3. Elytra very convex, with dense reticulations; ovipositor as long as, or longer than, the posterior femora.
4. Pronotum yellow-green; metazona short and transverse, leaving tympanal area of elytra free 9. POLITA, Bol.
- 4.4. Pronotum darkish green, metazona nearly square or transverse, but completely covering tympanal area of elytra 11. PEREZI, Bol.
- 3.3. Elytra less convex, with more open reticulation; ovipositor shorter than the posterior femora 12. BALEARICA, Bol.
- 2.2. Last ventral segment φ tumid; supraanal plate σ equilateral; anal segment σ not straight on posterior border, but faintly produced into very short obtuse lobes on each side of median sulcus.
3. Small species; anterior femora one-and-a-half times as long as pronotum.
4. Elytra with margin extended and openly reticulated.
5. Smaller (pronotum not exceeding 6mm.
13. MARTORELLII, Bol.

- long); upper border of anterior tibiæ unarmed or with a single spine in the middle; keels of pronotum sharp.
6. Colour dark reddish; elytra blackish-grey, the ground colour predominating; the veins few and yellow 14. CASTELLANA, Bol.
- 6.6. Colour green or yellow; elytra densely reticulated so that the yellow colour of the veins predominates 15. BRUNNERI, Bol.
- 5.5. Larger (pronotum 8mm. long); upper side of anterior tibiæ generally with three or four spines; keels of pronotum much more ill-defined 16. FLAVOVITTATA, Bol.
- 4.4. Elytra with margin more densely reticulated, with no regular areas.
5. Keels of pronotum distinct; cerci ♂ short and conical 17. PSEUDOLA, Bol.
- 5.5. Keels of pronotum very obtuse; cerci ♂ sharp, sinuate on inner side 18. OBSOLETA, Bol.
- 3.3. Larger species, with anterior femora scarcely longer than pronotum 19. ANDALUSICA, Ramb.

1. STEROPLEURUS CATALAUNICA, Bolivar.

Rather small, reddish above, paler below; the prozona is compressed and cylindrical; the metazona is convex, but not highly arched; the ovipositor is four times as long as the pronotum, and gently curved. Length of body, 25mm. ♂ and ♀; of pronotum, 6mm. ♂ and ♀; of posterior femora, 15mm. ♂, 15.5mm. ♀; of ovipositor, 23mm. ♀.

Taken by Masferrer at Sora, in Catalonia.

2. STEROPLEURUS CAVANNÆ, Targioni.

Green; the pronotum rough; the metazona arched and rounded; side flaps inserted at an obtuse angle; elytra black and yellow; cerci short and cylindrical, obliquely truncate, bent, and hooked, with a black basal tooth. Length of body, 32mm. ♂; of pronotum, 9mm. ♂; of posterior femora, 19mm. ♂.

An Italian species, taken on oaks, at Cosenza.

3. STEROPLEURUS ELEGANS, Fischer.

Sulci of pronotum, black; anterior tibiæ with no spines; colour olive-green; hinder margin of abdominal segments pale, with dark spots; subgenital lamina ♀ roundly emarginate. Ovipositor not twice as long as pronotum, rather strongly curved. Length of body, 30mm. ♂ and ♀; of pronotum, 8.5mm. ♂, 8mm. ♀; of posterior femora, 19mm. ♂ and ♀; of ovipositor, 16mm. ♀.

Taken near Rome, and in the Tuscan Apennines.

The Geometrides of Wimbledon Common.

By RALEIGH S. SMALLMAN, F.E.S.

I have read with great interest Mr. G. D. Millward's paper on the Macro-Lepidoptera of Wimbledon Common (*anteà*, vol. xix.), in which, however, he makes no mention of the Geometrides, hence the following notes. At a later date I may make a few notes on Mr. Millward's paper, or supplement it with a short account of the Pyralides and Crambides to be taken in the district. Melanism amongst the Geometrides in the district is of fairly common

occurrence, as exemplified by *Amphidasys betularia* ab. *doubledayaria*, *Oporabia dilutata* ab. *melana*, *Eupithecia rectangulata* ab. *nigrosericeata*, and, in a less degree, by *Fidonia atomaria* and *Cheimatobia brumata*. The district is hardly a damp one, but it is no doubt affected by the London smoke to a fair degree. I have found that, by working with light, by far the best results have been obtained, but an objection to thus working is that such a large proportion of males are obtained compared with females. The following list contains all the species I have taken here between 1904 and 1907, with the exception of a few Eupitheciids, which I have not yet properly worked out.

Urapteryx sambucata, common; *Epione apiciaria*, one ♂ beaten from oak, July 29th, 1906; *Rumia crataegata*, very common; some specimens have completely yellow fringes, whilst others have the fringes to all wings dotted with brown. *Metrocampa margaritata*, fairly common at light; *Ellopiia prosapiaria*, ♂s come to light occasionally; *Eurymene dolabraria*, three ♂s at light, June, 1906; *Selenia bilunaria*, one ♂ at light, August 18th, 1907; *Odontopera bidentata*, three, May 1906, and one, June 1906, these are fairly dark; *Crocallis elinguaris*, one at light, August 9th, 1904, and one on paling, August 14th, 1907; *Ennomos alniaria*, fairly common at light; *E. fuscantaria*, one ♀, August 20th, 1906, at light; *E. angularis*, two, August 1906; *Himera pennaria*, three, November, 1904 (lines on forewings darkly shaded), November, 1906, and November, 1907; *Phigalia pedaria* (*pilosaria*), one on paling at Morden, February 11th, 1906; *Amphidasys betularia*, fairly common. On the average six typical specimens are taken to three ab. *doubledayaria*, and one so-called intermediate (see *Ent. Rec.*, xviii., p. 240); *Hemerophila abruptaria*, one on paling, May 20th, 1905, and one at light, May 28th, 1906; *Boarmia repandata*, one at light, July 4th, 1904; rather dark, and might at first glance be taken for *B. rhomboidaria*. *B. rhomboidaria*, probably the commonest insect at light, and very variable in colour; *Tephrosia punctularia*, abundant on birch- and oak-trunks in May and June, occasionally at light; *Pseudoterpna cytisaria*, fairly common at light, but never in good condition; *Geometra papilionaria*, one fine ♂ in good condition at light, July 16th, 1905; *G. vernaria*, one fresh specimen at light July 8th, 1905; *Phorodesma bajularia*, one ♂ at light, June 24th, 1906; *Hemithea thymiaria*, common at light; *Acidalia bisetata*, three at light, August 7th, 1906, and August 11th and 13th, 1907; *A. incanaria*, fairly common on palings and at light; *A. aversata*, very common as also its ab. *spoliata*; *A. emarginata*, one at light July 26th, 1905; *Cabera pusaria*, common; *C. exanthemaria*, occasionally; *Panagra petriaria*, plentiful amongst undergrowth in the woods; *Fidonia atomaria*, very common in June, but restricted to certain places on the Common. Several of the ♂s show traces of melanism, the dark colour predominating; *Abraexa grossulariata*, common; *Lomaspilis marginata*, not very common; *Hybernia progemmaria*, not uncommon, specimens fairly dark and variable; *H. defoliaria* common at light and very variable; *Anisopteryx aescularia* common; *Cheimatobia brumata*, common on tree-trunks in cop., and ♂s at light, some of the specimens are very dark brown; *Oporabia dilutata*, common at light, specimens with unicolorous dark-brown forewings (ab. *melana*) occur; *Eupithecia centaureata* common; *E. vulgata*, abundant; *E. expallidata*, common at light; *E. rectangu-*

lata, fairly common, mostly melanic or pseudomelanic specimens; *Thera juniperata*, not uncommon, fairly dark; *T. variata*, one June 3rd, 1906; *Ypsipetes elutata*, worn specimens turn up occasionally; *Melanthia rubiginata*, plentiful at dusk in July 1904, since which time it has been much scarcer; *M. ocellata*, fairly common; *Melanippe rivata*, not uncommon; *M. montanata*, occasionally; *M. fluctuata*, common and variable. The specimens taken seem to include type forms *ab. fibulata*, *ab. incanata*, *ab. neapolisata*, and *ab. costovata*; *Coremia propugnata* turns up occasionally; *C. ferrugata* and *C. unidentaria* not uncommon; *Campptogramma bilineata*, very common, in some of the specimens there is a dark clouding of the central band; *Scotosia dubitata*, one at light, August 31st, 1906; *Cidaria testata*, fairly common; *C. dotata*, one at light August 5th, 1904, and another August 27th, 1907; *C. comitata*, one at light August 13th, 1904; *Eubolia palumbaria*, one at light, July 3rd, 1904.

The above list, which contains 60 species, could probably be much extended by anyone working the district in a systematic way at all seasons.

COLEOPTERA.

BRANTES PHANATUS, L., ETC., IN CUMBERLAND.—From time to time I come across beetles and other insects, in a timber-yard in Carlisle, which have been imported in the timber from various parts of the world. *Cerambyx heros*, *Callidium diuridiatum*, *Arhopalus fulminans*, etc., have occurred in this way, while among the Hymenoptera, the sawfly *Sirex gigas* is of frequent occurrence, apparently coming from spruce deals from New Brunswick, and deals from the Baltic seaboard. In March, 1906, I met with a very depressed, dark brown beetle, with long antennæ, under bark on a billet of wainscot oak from Austria. The insect was quite strange to me, and, being obviously a foreigner, I attached little importance to it, contenting myself with taking seven specimens, though many might have been obtained from similar billets in the same parcel. Lately I sent specimens to Mr. Newbery, with other imported insects, and he at once pronounced them *Brantes phanatus*, L. a species recorded in Britain from Putney (Rye), and Blackheath (Douglas), (Fowler, *Col. Brit. Isles*, vol. iii., p. 301). The origin of these specimens, I suppose, would be difficult to ascertain now, but there is a belief among coleopterists that they were foreign. At any rate the species has not apparently occurred in either locality since, nor elsewhere, a circumstance suggestive of its not breeding in Britain. I have seen nothing more of it here since 1906, so it has not established itself. Whether casual immigrants of this kind should be considered as British insects is doubtful, unless they breed and establish themselves, when there can be little reason for not admitting them to our list. It may be of interest to add that, *Brantes phanatus* is a very sluggish insect, in fact so sluggish that I thought all the specimens dead for some time after taking them, when they made a few lethargic movements.—F. H. DAY, F.E.S., 151, Goodwin Terrace, Carlisle. *January 1st, 1908.*

NOTES ON COLLECTING, Etc.

UNUSUAL POSITION FOR PUPA OF *AMORPHA POPULI*.—As it appears to be very unusual for the pupa of *Amorpha populi* to be found anywhere

except on the ground (no case is mentioned in *The Natural History of the British Lepidoptera*, iii., p. 483), it may be worth while to put on record the fact that, on February 9th, I found a pupa of this species in a small hole, about 2½ ins. across, full of decayed leaves, quite 4 ft. from the ground, in a poplar-tree in our garden.—EDWIN CAPON, 16, Sceptre Street, Mile End. *February 11th, 1908.*

NOTE ON BRITISH RECORDS OF *SIREX JUVENCUS*, F.—Indisposition prevented my replying in the following number of the *Entomologist's Record* to Mr. Eustace R. Bankes' query with respect to my note on the recent occurrence of *Sirex juvenus* at Chichester. I have shown the four *Sirices*, with metallic, blue-black bodies, in my possession, taken here at various times—one of which I have given to him—to my friend, Mr. H. L. F. Guernonprez, of Bognor. He pronounces them to be *Sirex noctilio*, F. [*Noctilis* is an erroneous spelling, I believe; at least, so I am informed by Mr. Guernonprez, who has been in correspondence on the subject with the Rev. F. D. Morice, who says that the terminal letter is *o* in all the works of Fabricius accessible to him.] Mr. Morice also wrote that he has now seen one genuine British *S. juvenus*, F., but that all the others with black antennæ may be considered *noctilio*. There is a specimen of *Sirex noctilio* in the cabinet of Mr. W. H. B. Fletcher, of Bognor, and another in that of Mr. A. Lloyd, of Bognor; both of which, like the four which came into my hands, are females. These are the only records of this *Sirex*, of which I am cognisant in this locality.—JOSEPH W. ANDERSON, Alre Lodge, Chichester. *February 18th, 1908.*

FORMICA SANGUINEA IN THE MIDLANDS: A CORRECTION.—I have only just seen the November number of the *Ent. Rec.*, in which, on p. 254, Mr. Donisthorpe mentions the capture of this species in the Midlands by Mr. Ellis, and speaks of it as a new record. This is a mistake. The species was discovered as far back as June 11th, 1892, by Mr. A. H. Martineau, and the locality has been well-known to Birmingham entomologists ever since. Its occurrence was recorded by Mr. A. H. Martineau in the list of Hymenoptera in the Worcestershire volume of the *Victoria County Histories*, the locality being described as Bewdley. As a matter of fact, I believe that Mr. Ellis was introduced to the small colony by Mr. Martineau himself.—COLBRAN J. WAINWRIGHT, F.E.S., 45, Handsworth Wood Road, Handsworth, Staffs. *February 16th, 1908.*

COLLECTING LEPIDOPTERA IN THE SOUTHEND DISTRICT AND ELSEWHERE.—I send a few notes as to lepidoptera observed last season (1907). I am afraid, however, that they will be regarded as merely a list of the slain. *Aglais urticae* and *Dasystoma salicella* were seen at willow-catkins at the end of March; *Vanessa io* and *Aglais urticae* at purple-nettle early in April. On the marshes, under willow-bark, I found a number of larvæ of *Eurrhyncha urticata*, which had crept up from a bed of nettles in the ditch below; I note that Buckler speaks of larvæ of this species hibernating in tough silk cocoons under bark of ash. I bred a few *Lithocolletis tristrigella* from elm on May 9th, and *L. emberizaepennella* from honeysuckle on May 11th. *Antispila pfeifferella* was flying among dogwood at Southchurch on May 12th. *Carpocapsa grossana* emerged on July 6th from beech-mast gathered at Warley last autumn. I was able to get away for a few days to the East Kent coast in July, and, though not favoured with good weather, found a number of interesting

lepidoptera, among them *Douglasia ocnorostomella*, in plenty, flying over *Echium*; *Crambus chrysonuchellus*, *Eubolia lineolata*, *Brachycrossata cinerella*, *Cemiostoma scitella*, on hawthorn; *Dicrorampha saturnana*, on tansy; *Paedisca ratzeburgiana*, on fences, under Scotch fir; *Nyctegretis achatinella*, *Anerastia lotella*, *Bryotropha distinctella*, *Lithosia lutarella*, *Acidalia ochrata*, *Aporia crataegi*, and *Anthrocera lonicerae*, whilst *Teleia fugitivella* was very plentiful on fences. I hoped to get one or two good things out of the sea-buckthorn and dwarf-sallow, but the former yielded only *Hedya ocellana* and *Tortrix unifasciana*, and the latter *Hypermoecia cruciana*. Towards the end of the month, although the weather continued unfavourable, I ventured as far as the New Forest, with results that most old hands would consider disappointing. I found *Pempelia palumbella* on the heaths, *Olindia ulmana*, *Hydrocampa stagnata*, *Glyphipteryx thrasonella*, *Hyria muricata*, *Retinia buoliana*, *Crambus sylvellus*, *Pleurota bicostella*, *Selidosema ericetaria*, *Tephrosia bistortata*, *Scoparia basistrigalis*, *Retinia pinicolana*, *Cedestis farinatella*, *Acidalia straminata*, *Cleora glabraria* (one in a spider's web), *Ellopiopsis prosapiaria*, *Elachista rhynchosporella*, *Ecophora lambdella*, and larvæ of *Ennomos erosaria*, *Cidaria psittacata*, and *Eupithecia pulchellata*. *Tortrix viburniana* and *T. rosana* occurred in great plenty among bog-myrtle. I bred *Cymatophora duplaris* and *Cochlidion testudo* on July 11th, from larvæ obtained at Eastwood in the autumn. *Acentropus niveus* came to light at Southend on August 4th, and *Malacosoma castrensis* ♀ on the 5th. *Paedisca profundana*, bred from aspen, on the 7th. *Lita maculiferella* was flying freely at Pitsea in the early evening of the 10th. *Euzophpera pinguis* occurred on ash-trunks at Great Wakering on the 17th. *Bucculatrix cristatella* was flying over yarrow and broom at Coombe Wood, Thundersley, on the 24th. *Orthotelia sparganiella* occurred among *Sparganium* at Pitsea on the 25th; *Apamea basilinea* at light, at Southend, September 9th, and *Ennomos autumnaria*, September 25th and 29th, four at light, all of them females. I have noticed this season a rather large number of females of *Entrichta quercifolia* and *Neuronis popularis* settled under the electric light standards; but I suppose it is usual for the heavy females to be so found, the lighter and more active males being more often taken with the net.—F. G. WHITTLE, 7, Marine Avenue, Southend-on-Sea. December 30th, 1907.

RESTING-HABIT OF *LEPTOSIA SINAPIS*.—It is very curious to notice how all the old writers (and some of the new) insist upon the interesting and ghostly fact that this butterfly is never seen to rest, but is continuously flitting along. I have seen this insect in large numbers on the Devonshire coast, and in the woods of Northamptonshire, and, on all occasions, they have not hesitated to rest on flowers. I found them rather hard to take on the wing, and, in consequence, waited until a flower attracted them, when an easy capture resulted.—S. G. CASTLE RUSSELL, M.I.E.E., F.E.S., Sunbury. December 30th, 1907.

NOTES ON LIFE-HISTORIES, LARVÆ, &c.

THE EGGLAYING OF *APORIA CRATÆGI*.—On July 10th, 1907, at Luz, *Aporia crataegi* was abundant and I observed several females discourage the males by opening their wings and raising the abdomen; this seemed effective in a very few seconds, one female repelling two

males successively in this way. I observed one female egg-laying. She selected, as it happened, the unusual course of laying underneath a leaf, and was seated nearly inverted; she also took an unusual time between each egg, six seconds, eight seconds, and seventeen seconds. The eggs were, however, truly laid. Between the layings she raised her body, so that it occupied the normal position in a sort of porch formed by the hindwings and with the extremity a good half-inch from the leaf. To lay an egg the abdomen was bent down, pushing apart the wings and curving till it touched the leaf, the butterfly, otherwise, remaining quite at rest. This note is as made at the time, and may help to confirm and make clearer previous notes on the oviposition of *A. crataegi*.—T. A. CHAPMAN, M.D., Betula, Reigate. December 6th, 1907.

THE FOODPLANT OF *ACIDALIA VIRGULARIA* (INCANARIA).—*Acidalia virgularia* occurs commonly in this town in two restricted localities, and for the last three or four years I have endeavoured to discover its natural foodplant, but unsuccessfully until this year. It is ivy. I found eight larvæ this year in April, together with the larvæ of *Zanclognatha tarsipennalis*, which were full-fed. The *A. virgularia* larvæ were rather more than three-parts grown, and fed exceedingly slowly until the middle of June, and all produced imagines. I tried them with withered leaves of dock and later with knotgrass, but they would not eat anything but ivy. They were rather difficult to find as searching with a lamp at night was useless. I think they must feed for a very short time in the early morning, as I have watched them at nearly every hour from 8 a.m. to midnight, and never saw one move much less eat.—RICHARD FREER, M.D., Rugeley, Staffs. December 11th, 1907. [This species is very abundant in June, and, in fine summers, occurs sparingly also in late August and early September, in Westcombe Park on a fence overhung with ivy, which we have long since assumed to be its foodplant though we have never tested it.—ED.]

NOTES ON THE LIFE-HISTORY OF *CYCLOPIDES PALÆMON*.—An egg deposited on the underside of a leaf of *Brachypodium sylvaticum*, on June 9th 1907, at 3.25 p.m., by a female received from Lincoln, I kept apart for observation, and was fortunately in the act of watching it on the morning of the 28th when, at 10.8 a.m., a jet-black head appeared at the edge of the micropyle and the larva immediately, with semicircular movements of the head, commenced to eat away the egg-shell, continuing until nothing remained but its base. It now appeared, under a low-power lens, as pure white with a comparatively large and shining black head. So soon as it had consumed the egg-shell, it descended the leaf along its edge and crawled on to a smaller and only partly developed blade. This it ascended to the height of some two inches, and, after a few moments' hesitation, retraced its steps and reached the original and older leaf. Throughout this time, the head was turned rapidly from side to side as if in the act of spinning, although no silk issued. Travelling to the top of this leaf, and descending for a couple of inches along the midrib on the upperside, it stopped. This spot evidently suited it, for, remaining motionless some three seconds and reversing its position, *i.e.*, taking up an attitude with head to the tip of the blade, it commenced spinning by attaching one end of the thread to the very outside on one side, and carrying the strand across to the opposite side but not quite to the edge.

The following movements I carefully timed with a stop watch. The first five strands were ejected and placed in position slowly, and with apparently great care, the time occupied being $18\frac{3}{4}$ seconds, but the rate then quickened and I found the remaining 109 strands forming the first cable (there were thus 114 in all) were issued with marvellous precision at the rate of one every $1\frac{1}{2}$ seconds. Thus the total time taken to complete this "rope" was $182\frac{1}{4}$ seconds. The wonderful uniform rate of movement was startling. The cable had drawn the edges to within $\frac{1}{12}$ of an inch to each other. Seven and a half seconds' rest in its now commenced "mine" and it moved slightly backwards to below the fastening, and peering over its work, seemed to be contemplating the proper position of the next. This it began in $11\frac{3}{4}$ seconds from the completion of the first. This next series of threads, was not placed quite equidistant on each side of the original, the measurements apart being $\frac{7}{8}$ inch and $\frac{9}{8}$ inch respectively. Very similar was the commencement of its formation; five strands were again worked slowly, although in somewhat faster time, *viz.*: $16\frac{1}{2}$ seconds, but the uniform rate of the remainder was absolutely as before, one in every $1\frac{1}{2}$ seconds. There were fewer strands this time, the total being only 83. This second fastening was stretched from edge to edge, unlike the first, and brought the blade edges together till they were almost touching. The larva retired into the shelter of its now nearly completed home and remained motionless for $10\frac{1}{2}$ minutes, after which the third and final cable was commenced. This was placed $\frac{2}{5}$ of an inch below the last and the rate of weaving was practically as in the second, 84 strands being employed.

The tube was now finished, the last fastening pulling the blade edges together so that they were slightly overlapping in the full length of the mine which was just under an inch, and under its cover the larva now disappeared. No attempt to commence devouring its home during the next two days appeared to me to be curious, and not until July 3rd, did it make a movement so far as I could judge. On that day at 3 p.m., I noticed a quick jerky motion of the head which was thrust out between two of the cables. This peculiar motion, which, after a short time, caused one of the "ropes" to break away, seemed to mean that something was amiss. At 5 p.m. it had crawled forward, and the head and thoracic segments were clear of the tube, but it immediately retreated and continued these backward and forward movements for four minutes, when it finally retired out of sight. The next day it was dead. The first moult was evidently due to take place on the 3rd when the above curious movements were made.—H. Wood, Ashford, Kent. November 10th, 1907.

"FORWARD" LARVÆ OF *ARCTIA VILLICA*.—In June last, some eggs of *Arctia villica*, laid by a ♀ captured in Essex, came into my possession; they hatched in due course, and the larvæ fed well chiefly on plum. As they were actively feeding at the end of July they were taken abroad with me, and wandered through southern Switzerland during August, at different elevations, and in all sorts of temperatures. Continuing to feed in September, I went on giving them plum as long as it lasted, and then chrysanthemum. They all fed on, and, in early December, two appeared to be nearly fullfed and one spun-up about the middle of the month, whilst the other spun-up during the first week of January, the rest feeding on cornel,

and, when obtainable, rose. A ♀ appeared on January 16th, but unfortunately remained a cripple; the second is still a pupa, and, of the remaining larvæ, one is apparently quite fullfed, and seven others nearly so. As it is, I believe, not usual for this species to produce "forward" larvæ, even in confinement (the larvæ have been kept in a living-room), I thought it well to put this fact on record.—A. M. COCHRANE, Lewisham. *January 30th, 1908.*

PERICALLIA SYRINGARIA AT SUNBURY-ON-THAMES, WITH A NOTE ON ITS LARVAL HABITS.—I have, this autumn (1907), found the larvæ of this species occurring very commonly in my garden here. I have never taken or seen the perfect insect in this locality, and it was only by accident that I found the caterpillars, whilst searching for other kinds. In published descriptions of this larvæ, I read that it is easily alarmed and immediately drops to the ground, especially if the branches of the foodplant are shaken. My experience is exactly the opposite. All my larvæ I found hanging suspended from a single silk cord, from which they resolutely refused to be parted. Frequently when chipping them (which on account of the difficulty in inducing them to let go of the cord, I found the most convenient way of taking them) they were jerked out of the chip-box. The favourite position of the larva appears to be the pendant one on the silk cord. All those I have in captivity are invisible during the day, but, at dark, they all hang suspended, in the very curious doubled up square position, looking very much like little spiders, which they appear to imitate. Indeed, the casual searcher would undoubtedly pass them over as spiders. The habits of this larva may alter after hybernation, but, at this season of the year, I find that they are very easy to secure, and not easily alarmed.—S. G. C. RUSSELL, M.I.E.E., F.E.S., The Corner House, Sunbury-on-Thames. *December 29th, 1907.*

SCIENTIFIC NOTES AND OBSERVATIONS.

GYNANDROMORPHIC EXAMPLE OF SATURNIA PAVONIA (CARPINI).—I bred a curious specimen of this species this year (1907), from a batch of ova obtained from a female reared from larvæ found at Ottershaw in Surrey. The following is a rough description:—

HEAD: Typical female. **ANTENNÆ:** Typical male. **BODY:** Typical female. **RIGHT UPPER-WING:** Typical female. **LEFT UPPER-WING:** Typical female. **RIGHT UNDER-WING:** Typical female, except that a yellow line crosses the wing (just above the ocelli) in the direction of the head. **LEFT UNDER-WING:** Typical male. **SIZE:** Considerably larger than ordinary male, and smaller than ordinary female.

This is a very curious specimen. The feathered antennæ look very out of place on the large head and body. The predominating sex I should take to be female.—S. G. C. RUSSELL, M.I.E.E., F.E.S., The Corner House, Sunbury-on-Thames. *December 30th, 1907.*

VARIATION.

EPIRRITA (OPORABIA) AUTUMNATA, BORK., AT TILGATE.—As very little is yet known of the range of this species in the south of England, where, at the best, it must certainly be quite local, it is very interesting to be able to record that my friend Mr. L. A. E. Sabine, of South Norwood, has taken some beautiful forms in Tilgate Forest, quite as well-marked and variable as the Scotch. He has kindly furnished me with the following details: "October 27th, 1907, 1 ♂; November 2nd,

1 ♀; November 10th, 1 ♀. All three specimens taken at rest on birch-trunks, and, being in very fine condition, it is probable that they had emerged from the pupæ but a very short time previously, and had never flown. Both this species and *E. dilutata* are to be taken in this locality, and, possibly, if well worked for, it would be found that *E. autumnata* is not uncommon, as the three examples mentioned were selected (on account of their being so beautifully fresh) from several specimens, which were considered at the time to be *E. dilutata*, but which were most likely, in some cases at least, true *E. autumnata*." In case any readers have not followed the history of the re-discovery of this long-overlooked species, I may add that it differs from *E. dilutata* in the structure of the ♂ antennæ and genitalia, in the more glossy wings, usually sharper-marked, but being even more variable; also it is abundantly distinct in the egg and larval stages.—LOUIS B. PROUT. *January 8th, 1908.*

A DARK FUSCOUS ABERRATION OF ENNOMOS AUTUMNARIA.—Mr. Newman of Bexley, has bred some most interesting aberrations of this species, together with the type, from an East Kent locality. In the female the wings are unicolorous dark fuscous with the exceptions of the extreme base which with the thorax is yellow as in the type, and the body entirely black except the dorsal portion, which is slightly marked with yellow. The male only differs in markings from the female by having a yellow fringe.—V. ERIC SHAW, Bexley, Kent. *November 14th, 1907.*

VARIATION IN MELITEA AURINIA AND DRYMONIA CHAONIA.—At the meeting of the Entomological Society of London, held on February 5th, 1908, exhibited—(a) A long series of *Melitaea aurinia* bred from ova from West Meath parents, the ♀ parents being very rich dark forms; the offspring followed the ♀ parents to a great extent, being rich dark forms, a small percentage being, however, somewhat lighter in ground colour (= *hibernica*, Birchall). (b) A series of ♀s from East Kent of the usual Kentish form, the specimens showing a wide range of variation; owing to the great lack of sunshine in May, 1907, the pupal stage lasted four weeks instead of ten days or so, and a large percentage died in the pupal stage. (c) A series bred from a S. Devon typical ♀; these were very ordinary forms and a very large percentage of deaths in the pupal stage owing to cold and lack of sunshine. (d) A series from S. Wales, wild collected larvæ; received full-fed at end of March, and, being abnormally early, emerged very well, as all were out before the bad weather started; very little variation disclosed. (e) A series from Carlisle, wild collected larvæ; these larvæ were fearfully parasitised, over 75% being stung and a very short series was bred, giving no idea of the range of variation. (f) A series from Isle of Wight, wild collected larvæ; unlike the Carlisle larvæ, not one of these was parasitised, and were very forward, being three-quarters fed when received at the end of March; all emerged well, but the quantity at disposal being small, most were spoilt in obtaining pairings and ova. (g) A long series of *Drymonia chaonia* bred from ova from Perth parents, both of the typical dark brown form; the series showed a great range of variation, a good percentage following the parents; a large percentage of intermediate forms, and about 15% with the white band on forewings well defined. (h) A series from New Forest parents, this form showed a strong contrast with the Perth race, the ground colour being much whiter and the white on forewings very pronounced, bringing out the lunar spot very conspicuously. (i) A series from a pairing

obtained from Perth ♀ and New Forest ♂, the experiment producing a very mixed series, the general tendency being to follow the dark Perth ♀ parent; very few (three or four) being as light as the ♂ parent. (k) A series from an Isle of Wight wild captured ♀, this form being quite distinct from that of the New Forest, having a yellowish tinge, and the ground colour being about intermediate between the darkest Perth and lightest New Forest forms.—
L. W. NEWMAN.

CURRENT NOTES.

Fleet-Paymaster T. B. Fletcher, R.N., is to be congratulated on his excellent notes on the lifehistory of *Buckleria paludicola*, a Cingalese species, whose larva, like our *B. paladum*, feeds on *Drosera*, the species here affected being *D. burmanni*. It would really be very remarkable if the whole of the *Buckleria* group were proved to have "sundew"-feeding larvæ. It is quite clear that the species is a *Buckleria*, the imago being without any scale-patch on the 3rd plumule of the hindwing, and not a *Trichoptilus*, in *sens. strict.* The author's notion that the long spurs on the hind legs of plumes are of use to stretch the wings, separate the plumules, and comb out the long cilia, directly after emergence, is worthy of attention and observation.

It is with the greatest regret that we have to chronicle the death, on December 25th last, of Canon Zapater, the well-known Spanish entomologist and botanist, at the advanced age of 91. Much of our early knowledge of the insects of Aragon was due to him, and his "Catalogue of the Lepidoptera of the Province of Teruel," etc., has long been a recognised and authoritative list of the lepidoptera of this district.

German entomologists have commenced to interest themselves in the phenomenon of "Melanism." Meissner has a paper (*Soc. Ent.*, xii., p. 153), also Kuhnt (*Entom. Wochenblatt*, xxv., p. 14, and again p. 21), whilst Rey also has a note (*op. cit.*, p. 22).

One does not get a plethora of good entomological material from Italy; it is, therefore, with the greatest pleasure that we note the receipt of the *Bollettino del Laboratorio di Zoologia Generale e Agraria*, vol. i., with many excellent plates and 234 figures in the text, published by E. Dalla Torre, Premiato Stab. Tep. Visuviano, Portici, Italy. The contributors are:—F. Silvestri, "Contributions to our Knowledge of *Anajapyx vesiculosus*, one of the Thysanurids," "A Contribution to the biology of *Litomastix truncatellus*," and "Description of a new genera of apterygotus insects representing a new order"; G. Leonardi, several papers on Coccids; G. Martelli, "Contribution to the biology of *Pieris brassicae* and its parasites," and "On some parasites of *Ocnogyna baetica*, Ramb."; L. Masi, "Contribution to a Knowledge of the Italian *Calcididi*." The papers appear to be especially well written.

A most important Bulletin entitled "A Preliminary account of the Biting-Flies of India," has been published by H. Maxwell-Lefroy, M.A., F.E.S., the Government Entomologist of India. (It may be obtained from the Government of India Central Printing Offices, 8, Hastings Street, Calcutta, Price 1s. 6d.) The notes on the Tabanids and Muscids (pp. 32-35) are particularly interesting, and the method of describing the life-history under the heads of "Egg-laying," "Eggs,"

"Larva," "Pupa," "Enemies," and "Habits," following in a mild way our own method of describing a life-history, at any rate, allows one easily to trace the lacunæ, which are so easily hidden when a very imperfect life-history is made continuous. Indeed, it is not until a life-history is dissected in this way, that one recognises how much ignorance remains unsuspected in a life-history written as a piece of continuous composition.

Dr. Manon writes, as if it were a phenomenon just discovered, a short paper, that finds place in the *Bull. Soc. Ent. de la France*, pp. 32-3, on the occurrence of composite cocoons in *Bombyx mori*. This particular peculiarity is of course well-known, and has been fully discussed in the *Natural History of British Lepidoptera*, vol. ii., pp. 443, 511-12, 540, 560, and vol. iii., pp. 27, 328-9, where a large number of examples relating to the composite cocoons of *Lachneis lanestris*, *Malacosoma neustria*, *M. castrensis*, *Pachygastris trifolii*, *Saturnia pavonia*, etc., are dealt with.

Le Cerf publishes (*Bull. Soc. Ent. France*, p. 21) the description of a new variety of *Thais cerisyi*, from the Mountains of Louristan, Persia, near var. *cretica*, with wider, and more rounded, hindwings than any other form of the species, these wings being absolutely entire, and without any trace of the characteristic crenulations of *Thais*, etc. He names it var. *louristana*, and bases the description on 2♂s. Oberthür describes a new ♀ form of *Agriades bellargus* under the name of *coelestis*, from Vendée, etc. (*op. cit.*, p. 25), and a new form of *Dryas paphia* var. *dives* from Algeria.

At the meeting of the Entomological Society of London held on March 4th, the question of raising the life membership fee from 15 guineas to 20 guineas was discussed. As a matter of actuarial business, based on the length of life of "Life Members" since 1840, it was clearly shown that the present "compounding" subscription was too low. On the other hand, certain important speculative items entered into the problem. In the final voting the present life subscription of 15 guineas was maintained, the voting being 27 in favour of 15 guineas as against 25 in favour of 20 guineas. Almost 20 Fellows present refrained from voting. A hint by one Fellow of a variable life-subscription based on age was not followed up. *

The Rev. G. Wheeler, exhibited at the same meeting, some puzzling *Melitæas* taken at Reazzino, between Locarno and Bellinzona, which he was inclined to refer to *Melitæa britomartis*. Apart from the point as to whether they were referable to *britomartis*, Mr. Tutt suspected that they were a southern form of *Melitæa dictynna* with very open markings on the upperside; some examples not very unlike them having been taken by himself and Dr. Chapman in the Tyrol.

It is with the greatest regret that we record the death of Mr. Herbert Goss, which took place on February 9th. The deceased gentleman served for many years as secretary of the Entomological Society of London, having joined the Society in 1874. His actual knowledge of practical entomology was of the slenderest. A summary of already published details on fossil insects from his pen appeared in the *Ent. Mo. Mag.* many years ago; his other published notes referring merely to the capture, etc., of the rarer British butterflies, which he hunted with remarkable assiduity. A few day-flying moths also interested him, but this was practically all. Yet the work that he did

for the Entomological Society of London was great, and highly appreciated, a proof that a really energetic man with scientific tastes may make an excellent secretary without being in any way a scientist.

Dr. Hodgson exhibited at the City of London Meeting on January 7th, amongst a large series of *Agriades bellargus*, a ♀ specimen in which two-thirds of the lower left wing was of the ♂ blue, and some small dashes of the same colour were on the upper left wing. The abdomen was ♀.

At the same meeting Mr. H. M. Edelsten exhibited *Egeria andreniformis*, reared from Kent and Bedfordshire larvæ, together with *Meniscus bilineatus*, a parasite of this species.

At the meeting on January 21st, Mr. A. J. Willsdon exhibited examples of *Pararge egeria*, bred January 20th, 1908, from ova laid by a female taken at Torquay, towards the end of September, 1907. The first imago emerged on December 25th, and it was noticed that, although the pupæ remained in a warm room in which the larvæ were reared, emergence ceased whenever frost set in, and was not resumed until milder weather returned.

At the same meeting Dr. G. G. C. Hodgson read a paper in which he advanced the theory that variations in climatic conditions tended to increase or decrease sexual dimorphism. From observations made, and material collected during a number of years, he deduced the theory that in hot sunny years sexual dimorphism is increased, while in cold rainy seasons this dimorphism is lessened. One wonders to what forms of sexual dimorphism this generalisation is assumed to apply.

At the meeting of the Entomological Society of London, held on February 5th, 1908, the President announced that he had nominated Dr. THOMAS ALGERNON CHAPMAN, M.D., F.Z.S., Professor RAPHAEL MELDOLA, F.R.S., F.C.S., and Mr. HENRY ROWLAND-BROWN, M.A., as Vice-Presidents for the Session 1908-9. The President also announced that the Council had elected Mr. JAMES WILLIAM TUTT to serve as a member of the Council in the place of the late Mr. ARTHUR JOHN CHITTY, deceased.

At the same meeting Mr. H. St. John K. Donisthorpe showed eleven species of ants taken in the hothouses in Kew Gardens in December, 1907, and January, 1908, eight † being new to the published Kew list, and six * species not before recorded as introduced in Britain. The species were:—(1) *Prenolepis longicornis*, Latr., ♀s and ♂s. (2) † *Tetramorium simillimum*, Smith, ♂s. (3) *Technomyrmex albipes*, Smith, ♂, ergatoid ♂ and ♂s. (4) * † *Wasmannia auropunctata*, Roger, ♂, ♀s and ♂s. (5) *Triglyphothrix striatidens*, Emery, ♂s. (6) * † *Prenolepis flavipes*, Smith, ♂, ♀s and ♂s. (7) * † *Playiolepis alluardi*, Forel, ♂s. (8) * † *Prenolepis caeciliae*, Forel, ♂s. (9) † *P. vividula*, Nyl, ♂s. (10) * † *Strumigenys rogeri*, Emery, ♂s. (11) * † *Ponera punctatissima*, sub. sp. *boerorum*, Forel, ♀ and ♂s. All found in numbers, except the *Ponera* and the *Strumigenys*.

Commander J. J. Walker also exhibited two specimens of the rare *Pyralis lienigialis*, Zell., ♀, taken at light in his house at Summertown, August, 1906 and 1907.

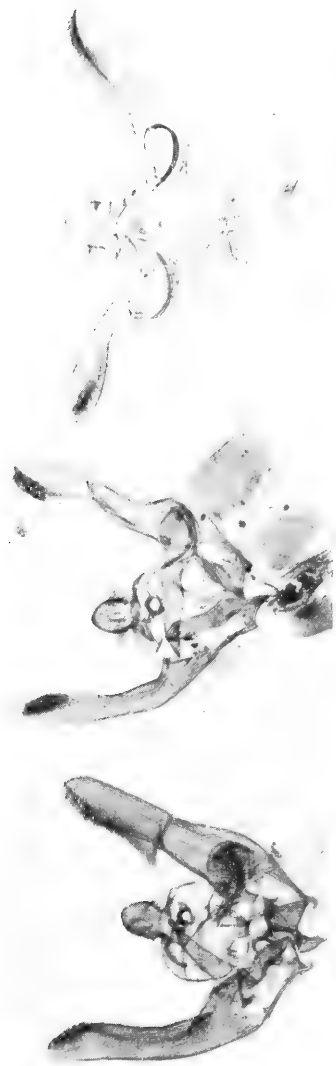
Dr. K. Jordan exhibited the Papilionid, *Troides alexandrae*, Rothsch., remarkable for the beauty of the ♂ and the gigantic size of the ♀, newly discovered by A. S. Meek, in the north-eastern portion of British New

Guinea at some distance inland from the coast. The species is nearest to *Troides victoriae* from the Solomon Islands, of which a very distinct geographical form (*rubianus*) was shown for comparison. A remarkable gynandromorphic specimen of *Troides haliphron*, was also exhibited; it was obtained by Dr. L. Martin in South Celebes, the left side being ♀ and the right side ♂.

Mr. R. Adkin exhibited specimens of *Tortrix pronubana*, Hb., reared in June and July from larvæ collected, at Eastbourne, in May, also others reared in autumn from ova deposited by moths of the June emergence. He said that, of the larvæ derived from the June emergence, the majority produced moths in the autumn, but a portion of them hibernated when nearly if not quite fullfed, and that the larvæ derived from the autumn moths hibernated quite small. He therefore concluded that, when the habits of the species came to be better understood, it would be found that, in this country, as had been shown to be the case in Guernsey, it was practically continuously-brooded throughout the summer months, the chief emergences taking place in June and October, but with stragglers appearing probably in every month from April to November. Mr. J. W. Tutt remarked that in the south of France it was common in March and April, at Digne and Draguignan.

At the same meeting Mr. Guy A. K. Marshall read a very important paper entitled "On Diaposematism, with reference to some Limitations of the Müllerian Hypothesis of Mimicry." In this he pointed out the difficulty of accepting the idea of a mutual simultaneous mimicry between two unpalatable species such as is postulated by the hypothesis of Diaposematism. It was suggested that an initial inequality in the individual numbers of the two distasteful species was an essential condition for the production of Müllerian mimicry, and that, in such circumstances, the mimetic approach would always be in one direction only, namely, from the rarer species towards the more abundant; for any initial variation from the latter towards the former must be disadvantageous. The various cases which have been put forward as proving the existence of Diaposematism in nature were critically examined, and it was contended that the facts could be more satisfactorily interpreted on lines which did not involve the assumption of a mutual interchange of characters between mimic and model. While the great importance of Müller's principle was fully recognised, it was pointed out that it had certain definite limitations, and the attempt to explain all cases of mimicry among butterflies on this theory was contested. On the other hand, it was held that the wide significance of Bates' principle had not been adequately appreciated, and it was urged that this theory would afford an explanation of many cases of mimicry between unpalatable species, which had been previously considered as purely Müllerian in character.

ERRATUM.—The omission of some words in the "Current note" (p. 45) on two new species of *Nepticula* has rendered the reading ridiculous. Joannis describes the imago, the larva, the cocoon, and life-history of *N. spinosella*, compares the larva and mine of *N. plagicolella* with those of *N. spinosella*, and the imago of the latter with the two other "prunellier"-feeding species—*N. prunetorum* (the head being reddish instead of black and the golden tint on the inner margin near the base absent), and *N. plagicolella* (the purple tint being absent). Page 45, lines 13-15 should read—"The differences between the larva and mine of this species and those of *N. plagicolella* are pointed out, whilst the imago is compared with those of *N. plagicolella* and *N. prunetorum*."—ED.



1.

2.

3. Photo, A. E. Tonge.

ANCILLARY APPENDAGES OF SPECIES OF MARASMARCHA $\times 18$.

FIG. 1.—*M. agrorum*. FIG. 2.—*M. tuttodactyla*. FIG. 3.—*M. lunaedactyla*.
(All decidedly smaller than *M. lunaedactyla*.)

The Entomologist's Record, etc., 1908.



GENITALIA OF SPECIES OF *MARASMARCHA*.

FIG. 1.—*M. ASIATICA*. FIG. 2.—*M. GIGANTEA*. FIG. 3.—*M. LUNÆDACTYLA*.

Anthrocera achilleæ, Esp., added to the British list.

By E. A. COCKAYNE, F.E.S.

In October, 1907, I received from Mr. W. Renton, as *Anthrocera purpuralis*, some specimens of an Anthrocerid which did not appear to me to be that species. On comparing them with those in the British Museum, I found that they were certainly not *A. purpuralis* var. *interrupta*, Staud., to which variety they approximate most closely. They bore a strong resemblance, however, in general characters to *A. achilleæ*, Esp., especially to some specimens from Bergün, labelled ab. *riciæ*, Hübner, which differed from typical *A. achilleæ* in the much smaller size of the spots, especially the sixth, and the thinner, rougher, scaling of the wings, and in the greater hairiness of the abdomen. The Scottish specimens present these last characters in a still more marked degree, and a minute examination of the limits reached by the red scales showed that they corresponded exactly with some of the Bergün specimens. The antennæ, too, showed some variation, though always having the two terminal segments red, a character absent in *A. purpuralis*: some, both from Scotland and Bergün, have a patch of yellow scales on the dorsal surface of the last segment but one. Mr. Pierce kindly examined the appendages in the male, and found that they belong to the *jilipendulæ* and not to the *purpuralis* group. He further states that they appear to be identical with those of *A. achilleæ*. There is little doubt that Mr. Renton has discovered an isolated colony of this species near Oban, an insect not previously recorded from the British Isles.

I hope later in the year to hear further, and give a more detailed account of the imago, which is, perhaps, worthy of a varietal name. Mr. Renton hopes to have a more complete account of its habits in this country. For help in determining to what species these insects belong I must thank Sir George Hampson, Mr. Pierce, Mr. Tutt, Dr. Chapman, and Mr. Prout.

Anthrocera achilleæ, Esp., as a British species.

By J. W. TUTT, F.E.S.

Mr. Cockayne is to be congratulated on his determination in showing this species to be British. In spite of the present writer's offhand opinion that a couple of specimens submitted to him appeared rather to be *A. jilipendulæ* than anything else, Mr. Cockayne worked away at the specimens in the British Museum collection until he found some examples of *A. achilleæ*, captured by Zeller at Bergün, which came quite near to those he had from Scotland. On our then making a second and more careful examination we detected several minor items that supported this view, and a number of ♂ *A. achilleæ* from different continental localities that we could fortunately supply for dissection, has enabled Mr. Cockayne, with Mr. Pierce's help, to finally add this species to the fauna of the British Isles.

The species is an exceedingly abundant one in most of the localities in which we have collected on the continent, abounding in most of the hills of south-eastern France, northern Italy, and the valleys of Switzerland, Austria, etc. Standinger notes (*Cat.*, 3rd ed., p. 382) it as distributed through "eastern, south-eastern, and central Europe, Belgium, north Italy, Switzerland, Bithynia, Pontus, Armenia, Syria,

and the Altai," whilst special races are described from Asia Minor, the Pyrenees, Aragon, and Kurdistan.

The typical form of this species is found in most parts of Central Europe. Its main feature is the enlargement of the apical spot as in *Anthrocera purpuralis*, but, unlike this, the spot is hooked, and the basal and central spots are quite separate and distinct. We have, however, streaked forms, and the extension of the spots linearly to a small extent is not uncommon. We find, indeed, in our extensive series, a considerable amount of minor variation in various directions. We have already published in our "Notes on the Zygaenidae" pp. 8-12, an account of "*Zygaena achilleae* and its varieties," a paper that includes also extended notes on its habits and habitats, and which may now prove of especial interest to our British collectors.

It may be well to note here Staudinger's summarised notes on the varietal forms (with the addition of *flava*, Obth.). These are—

- (a) ab. *viciae*, Hb.—Spots small, the external one rounded.
- (b) var. (et ab.) *bellis*, Hb.—Larger, darker; southern Alpine valleys, and the Altai mountains.
- (c) var. (et ab.) *bitorquata*, Mén.—The anterior wings yellowish, with a narrow black border; Asia Minor.
- (d) var. *tristis*, Obth.—Wings diaphanous; forewings greyish; Pyrenees.
- (e) var. *aragonensis*, Staud.—Forewings with large red spots, often confluent; Aragon.
- (f) var. *antiochena*, Staud.—Smaller; anterior wings with large red spots; Antioch.
- (g) var. *phoenicea*, Staud.—Forewings almost entirely red; Kurdistan.
- (h) ab. *flava*, Obth.—Spots of forewings and hindwings yellow.

There is no doubt that the first specimen of *A. achilleae* captured in Britain and suspected as not being quite the species to which it was referred, is that noted in our *Nat. Hist. of British Lepidoptera*, i., p. 453, where we write: "ARGYLLSHIRE: Mountains in Glencoe district. On July 8th, 1898, flying in sun at 3 p.m., about 1000ft. above sea-level, a single very worn specimen of this species (*exulans*), or one not hitherto recorded as British (Sheldon)." This is practically the same piece of country as that from which Mr. Cockayne's specimens came. We will shortly try and find time to give a short note on its life-history.

Besides this Argyllshire locality we suspect another British one. This is in Cornwall, and it is noticed in *The Natural History of British Lepidoptera*, vol. i., p. 442, as a possible locality of *Anthrocera purpuralis*. We have little doubt that this species and *Anthrocera transalpina* (*hippocrepidis*, Hb.) occur in other western valleys of the British Isles, and possibly *A. carniolica*. All these are locally abundant in Brittany with *A. purpuralis*, and will most likely turn up some day. *A. hippocrepidis*, Hb., must not be confounded with our now well-known *A. hippocrepidis*, Stpbs., but, like it, it is a very *filipendulae*-looking species, though usually much brighter in colour.

Spring Butterflies in the Rhone Valley.

By A. S. TETLEY, M.A.

Having spent part of July and August in two successive years among the butterflies in various parts of Switzerland, I was anxious to visit that country during the spring months. My opportunity came last year at Whitsuntide, and the evening of Wednesday, May 15th,

saw us on board the Lancashire and Yorkshire's steamer "Duke of Clarence," at Hull, *en route* for the new Belgian port of Zeebrugge. Travelling all day Thursday by Brussels and Strassburg we reached Bâle at midnight, and rushed through the now familiar station to catch the night mail on to Lausanne. At seven the next morning we tumbled off the train at St. Maurice, the station next to Bex southwards, cold and tired and hungry, but keener than ever to unfurl our nets and begin field work. Mr. Wheeler had recommended us to make this place our centre, and here we stayed for over a fortnight. I should like to express my personal thanks to Mr. Wheeler for his very great kindness to myself on this tour and on one I made in the Rhone Valley in 1906. His advice and help were invaluable and the more highly appreciated as they were so willingly given to a perfect stranger.

After breakfast we turned out and crossed the Rhone into the Lavey woods. The morning was dull, with gleams of sunshine from 10 till 11.30, followed by heavy rain and a falling thermometer. We saw and took a few specimens of *Nisoniades tages*, *Cupido minima*, *Nemeobius lucina*, *Euchloë cardamines*, *Pieris rapae*, and *Nomiades cyllarus*. One or two *Anthocharis sinplonia* were noticed flying rapidly, out of range, probably the var. *flavidior*, Wh., as we afterwards took specimens in the same place close to Lavey.

Saturday, May 18th, was a horrible day, very cold and windy, and wet. During the night snow had fallen heavily on the higher ground, and, in the morning, we found it lying almost down to the level of the river. We walked to Vernayaz, and, after hours of fighting against the gale, came back by train. My friend, an ardent conchologist, found his prey in thousands on the dripping rocks and banks, and after dinner had a huge "boiling" of all kinds of choice snails. The next day was equally cold, and dull. We walked to Bex and found nothing but a few *Cupido minima* in the meadows. Larvæ of *Aglais urticae* were common enough, and here and there we found full-grown larvæ of *Aporia crataegi*. Whit-Monday was warmer, but still dull and showery. We went to Territet to call on Mr. Wheeler. Before doing so we had a short stroll above the town, and during half an hour's sunshine saw a few butterflies, *Powellia sao*, *Nisoniades tages*, *Cupido minima*, *Polyommatus bellargus* and *P. alexis*, *Callophrys rubi*, *Pieris napi*, *Euchloë cardamines*, one perfectly fresh *Melitaea parthenie*, and *Brenthis dia*.

On May 21st we had at last some hours of sunshine, though, after 2 o'clock, the clouds came up again as they seemed to do nearly every day. We spent the day in the Lavey Woods. Butterflies were not very numerous, but the abundance of spring flowers almost made up for the absence of insects. Orchids in profusion everywhere, Solomon's seal, lilies of the valley, and the Scarborough rarity, the May lily (*Smilacina bifolia*), *Aquilegia* and *Echium*, and a wealth of *Leguminosae*. Beside the butterflies seen on the previous Friday we found *Hesperia malvae*, common but all typical, *Nomiades cyllarus*, one ♂, *Cyaniris semiargus*, *Celastrina argiolus*, several specimens, *Brenthis euphrosyne*, *Papilio machaon*, one ♀ (we saw very few during our visit), *Iphiclydes podalirius*, *Colias hyale*, *Leptidia sinapis*, common, *Gonepteryx rhamni*, *Pyrameis cardui*, *Vanessa io*, and a single specimen of *Polygonia c-album*. *I. podalirius* we saw commonly

throughout the fortnight in the valley, most of them apparently being females. The next day, May 22nd, we went to Bouveret and worked up the rocky slopes above the lake between that place and St. Gingolph. Another sunless day produced nothing new. The weather, however, seemed to be growing warmer, and the next day we were more successful. We walked to Bex across the meadows under threatening skies which shed depressing showers on us till 3 o'clock, when a high wind cleared the clouds away, and we had a busy hour or two in a little meadow not far from Grion. A single *Erynnis alceae* fell to the net. *Powellia sao* was quite common, as also was *Nemeobius lucina*. So large and bright were the females of the latter, that several times I mistook them for *Brenthis euphrosyne* as they flew along the sides of the bushes. *Colias hyale* was abundant and so was *Melitara parthenie*, evidently fresh from the chrysalis. A few *Pararge megera* were the only other new butterfly observed.

Early next morning (May 24th) a telephone message from Mr. Wheeler took us to St. Triphon to meet him. The day was cloudy, but warmer, and we found butterflies much more abundant. We spent most of the day on the banks of a little stream close to the railway between St. Triphon and Bex. *Cupido sebrus* was quite common and in fine condition, male and female alike. *Nomades cyllarus* was going over, but several good females were taken. *Plebeius argyrognomon* occurred sparingly. There was quite a wealth of "blues" on the banks of the rushing cut—*Cupido minima*, *Cyaniris semiargus*, and *Polyommatus alexis* being all common, in addition to those already named. *C. sebrus* seemed very constant; I find I have one specimen with the spots on the underside of the secondaries very faintly marked. Two *Cyclopides palaemon* were taken on a little tract of marshy ground close to the river; Mr. Wheeler very kindly showed us where *Anthocharis simplonia* var. *flavidior* was to be taken, and, by careful watching of the *Biscutella* flowers, we managed to secure four or five. *Melitaea parthenie* was very abundant in meadows behind Mr. Fison's house, and one or two specimens were taken with the dark markings on the primaries forming something like a central band. *M. cinxia* occurred frequently, and an odd *M. aurinia*; *Euvanesa antiopa*, and *Eugonia polychloros* were seen, while, in the meadows by the railway, *Erebia medusa* was common.

The next two days (May 25th and 26th) we spent in the Nikolai Thal. Before taking the 11.10 train to Visp we put in an hour in the Lavey Woods, and got four *Anthocharis* var. *flavidior*, a single *Pontia daplidice*, and a few *Cupido sebrus*. Both days were brilliantly fine, and the journey to Zermatt and back—much of it on foot—was made under the best of conditions. Butterflies were scarce above St. Niklaus. Between Visp and Stalden, and for some way above St. Niklaus, *Euvanesa antiopa* was common enough, flying along the road and soaring up above the trees on either side. We took several *Anthocharis simplonia*, all above St. Niklaus, and a single specimen of *Pararge hiera*. *Erebia evias* was just out; but otherwise there was nothing to distract our attention from the flowers, which took us back a month or six weeks as we went up, until we found beds of *Crocus vernalis*, *Anemone hepatica*, and *Gagea lutea* in full bloom.

On Monday, May 27th, we went to Martigny to see if *Melitaea deione* var. *berisalensis* was out, but without success. The day was

very sultry and dull, and our exertions had tired us, so that I fear we did not do our duty by the object of our search. As we sat at lunch, close to La Bâtiaz, the first *Parnassius apollo* came sailing along, to fall an easy prey to the eager net of my companion, anxious to add to his *podalirius* laurels. *Hesperia carthami* was fresh out on the slopes of the castle hill, as also was *Polyommatus bellargus*. A single *Aporia crataegi* was taken, also close to the tower. In the afternoon we walked through the marshes, under the cliffs, to Vernayaz, but saw nothing noteworthy except numbers of *Lowia dorilis*, nearly all males, and a few perfectly fresh *Melitaea dictynna*.

The next day we climbed up the lower slopes of the Dent du Midi, to Vérossaz, and on above the hamlet for about 3000 feet, returning late in the day by Monthey. *Iphiclides podalirius* was common just above the valley—nearly all females busy ovipositing. A single *Cyclopterus palaemon* was taken off a manure heap in Vérossaz itself. The gentians and primulas (*Primula elatior* and *P. farinosa*) on the higher slopes were a sight never to be forgotten.

The next day was almost a blank. My friend left me to return to England, and the skies signalled his going with sixteen hours of heavy rain. On the following day I went up to Sion, as the clouds seemed lighter in that direction, and I was rewarded by a magnificent afternoon and a greater abundance of butterflies than I had yet seen. I spent the whole time in some meadows on the north and east sides of the town, getting round, finally, to the railway-banks, where they run close to the river below the castle rock. The meadows were a glorious sight. Big *Iphiclides podalirius* swung from the flower-heads with lots of *Aporia crataegi*, of which I saw several pairs in cop. At one place I snapped up two biggish blues, which proved to be *Lycaena amanda*, both very fresh, but they were all I saw. *Melitaea didyma* was common in the same field, *Aglais urticae* brilliantly red and fresh out; a few *Parnassius apollo*: scores of *Colias hyale* and common whites. But the railway-banks were the most prolific hunting-ground. "Blues" of various kinds were most abundant—*Agriades bellargus*, *Polyommatus hylas*, *P. alexis*, *Aricia astrarche*, *Plebeius* (*Rusticus*) *argus*, *P. argyrognomon*, *Celastrina argiolus* and, at last, *Everes argiades* var. *coretas*. I did not notice the last-named among the crowds of other "Blues" for some time, but when I had discovered it, I managed to get half-a-dozen beautiful specimens, but all males. Another denizen of the railway-bank was *Melitaea aurelia*, already beginning to be worn. Other butterflies I saw or took were *Agriades sylvanus* just out; one lovely ♀ *Pontia daplidice*; odd specimens, very small, of *Issoria latonia*, *Melitaea dictynna*, *Pararge maera*, and one worn *P. egeria*. Altogether that day I took 43 different species.

On May 31st I went to Territet and up to Glion, spending the whole day between Glion, Caux, and Sonciez. The meadows towards Les Avants were white with narcissi, among which flew swarms of *Nemeobius lucina*, *Hesperia malvac*, *Powellia sao* and *Colias hyale*. Coming down towards Sonciez I found another "butterfly corner." "Blues" were swarming—*Cyaniris semiargus*, ♂ and ♀; *Agriades bellargus*, all ♂s but one; *Polyommatus hylas*, all ♂s; and *P. alexis*. *Leptidia sinapis* was everywhere, while three *Melitæas*, *M. parthenie*, *M. cinxia* and *M. aurinia* flew together in bewildering abundance. *M. aurinia* was going over, but I got a good series, which I have not yet

properly examined. Mr. Wheeler told me to look out for named forms—namely, I believe, var. *orientalis*, H.-S. *M. cinxia*, I found varied a good deal, some being heavily marked with black. These await further examination also. Two *Erebia oeme* were somewhat of a surprise; they were all I saw. *Hemaris tityus* was common at *Pedicularis* flowers.

My last day, June 1st, I spent at Martigny again, beyond La Bâtiaz, to find *Melitaea* var. *berisalensis*, but again without avail. The day was dull and windy, with occasional showers. The only new thing was a couple of perfectly fresh *Melitaea athalia*.

Very few *Heterocera* were observed. On most evenings we strolled out and watched the electric lights outside the little town, but without success. On the rough hill-side, above La Bâtiaz, at Martigny, I found a few specimens of a "Burnet," which, I think, is *Anthrocera achilleae*; and two cocoons picked up (unfortunately I am not sure of the exact locality) produced *A. trifolii* ♂, and *A. hippocrepidis* ♀. A single *Diacrisia sanio* ♂ was taken at Lavey, where *Scoria lineata* was common in the meadows. Other Geometers noted were *Melanippe montanata* and *Bapta temerata*. *Aglia tau* was not uncommon at Lavey.

The following is a list of butterflies observed or taken, all in the Rhone Valley, from May 17th to June 1st:—*Erynnis alceræ*, *Hesperia carthami*, *H. malvæ*, *Powellia sao*, *Nisoniades tages*, *Argiades sylvanus*, *Cyclopterus palaemon*, *Loweia doritis*, *Cupido minima*, *C. sebrus*, *Cyaniris semiargus*, *Nomiades cyllarus*, *Argiades bellargus*, *Polyommatus hylas*, *P. alexis*, *P. amanda*, *Aricia astrarche*, *Plebeius argus*, *P. argyrogonomon*, *Everes argiades* var. *coretas*, *Celastrina argiolus*, *Callophrys rubi*, *Nemeobius lucina*, *Iphiclidus podalirius*, *Papilio machaon*, *Parnassius apollo*, *Aporia crataegi*, *Pieris brassicae*, *P. napi*, *P. rapae*, *Pontia daplidice*, *Anthocharis simplonia* var. *flavidior*, *Euchloe cardamines*, *Leptidia sinapis*, *Colias hyale*, *Gonepteryx rhamni*, *Issoria lathonia*, *Brenthis euphrosyne*, *B. dia*, *Melitaea auringia*, *M. cinxia*, *M. didyma*, *M. aurelia*, *M. parthenie*, *M. athalia*, *M. dictynna*, *Pyrameis cardui*, *Eucanessa antiopa*, *Eugonia polychloros*, *Vanessa io*, *Aglais urticae*, *Polygonia c-album*, *Pararge maera*, *P. hiera*, *P. megera*, *P. eyeria*, *Coenonympha pamphilus*, *Erebia medusa*, *E. erias*, *E. oeme*, *Melanargia galatea* (larva).

Everes argiades, Pall., and coretas, Ochs.: Are these distinct or merely local races?

By GEORGE T. BETHUNE-BAKER, F.E.S.

This is an interesting question, and wants clearing up. It has been referred to by Mr. C. Oberthür (*La Feuille des Jeunes Natur.*, p. 149, 1906) and also by the Hon. C. N. Rothschild (*Entomologist*, 1907, p. 199). The former gentleman evidently thinks *coretas* is a good species, but we have no proof of it, and we are just in the position of wanting the matter cleared up. Another question arises, ab. *decolorata*, Stgr., is this a form of *argiades*, or is it an aberration of *coretas*?

I have *argiades*, *coretas*, and *polysperchon* from Austria, Hungary, and Asia Minor, *decolorata* from Hungary and Turkestan, but in most cases I have not the exact locality nor the dates.

Does *argiades* fly with *coretas* in the Pyrenees, or at Budapest, or anywhere? I know both insects are found around Budapest. Are

they on the wing at the same time? If so, can we get specimens taken together to compare their genitalia?

I would appeal to your readers to help us to elucidate the matter.

At present I am not satisfied that we have proof enough to treat them as distinct species.

Notes on *Everes argiades*, and its ab. *alcetas*, Hb. (= *coretas*, Ochs.).

By J. W. TUTT, F.E.S.

In September last, the Hon. N. C. Rothschild published (*Ent.*, p. 199), a translation of a short paper by Mr. C. Oberthür (*La Fenille des Jeunes Naturalistes*, 4th ser., 1906, p. 149), tending to show that *Everes argiades* and its ab. *coretas* are separate species. This paper, however, is only one of a series recently published on the subject, viz., Jachontov, "Rev. Ent. Russe," iv., p. 96 (1904); Brown, "Bull. Soc. Ent. France," p. 11 (1905); Oberthür, "La Fenille des Jeunes Naturalistes," 4th ser., p. 149 (1906); Rebel, "Verh. z.-b. Ges. Wien," lviii., p. 32 (1908). As this is one of the species which has shortly to be dealt with in *The Natural History of British Lepidoptera*, these papers have naturally interested me.

We may premise by saying that this species appears to be one of the most widely-distributed in the world, covering even a larger area than that which we have recently worked out (*Nat. Hist. Brit. Butts.*, ii., nos. 18-23) for *Celastrina argiolus*. It occurs throughout Europe, Asia and North America, extending into the Oriental Tropical region in India and the East Indies. In all parts of its range it shows considerable variation—sexual, seasonal, etc.—which has been dealt with by Scudder (in America), de Nicéville (in India), and others. In Europe, the ordinary summer brood is known as *argiades*, Pall., the spring brood as *polysperchon*, Bergs., but one may safely assert that all spring examples are not *polysperchon*, Bergs. A number of other aberrational and racial forms have been dealt with, and have received distinctive names. Really *polysperchon* is a special form, with well-marked orange spots on the underside, but no silvery kernels, the ♀ blue with dark outer margins only, not a ♀ blue-tinted on dark ground. One suspects that most of the *polysperchon* recorded as such do not correspond with Bergstrasser's insect.

The American and Eastern Asiatic examples are generally strongly marked on the underside, so are the Indian, although de Nicéville states that, in India, some examples have the usually well-developed orange markings of the outer margin of the underside of the hindwings near the tail obsolescent, whilst he has not seen any in which they have been absolutely absent. When, however, we enter Europe, this particular form with no orange on the underside of the hindwings arises, apparently, in some places as a rare aberration in *both* broods, in others as a common aberration in *both* broods, whilst in yet others it seems to supplant the type. This form is generally known as *coretas*, Ochs. One suspects that, if lepidopterists searched the literature of these things for themselves, instead of following the chance references of a so-called standard synonymic list, which, in the nature of things must always be characterised rather by its omissions than what it contains, the former would be known as *alcetas*, Hb., described in 1806 as having "the

underside without a trace of the usual ochre-coloured suffusion." Hübner's example was an Austrian one, so also was Ochsenheimer's, the latter noting, in 1808, that he had "seen an aberration in Schiffermüller's collection under the name of *coretas*, in which the reddish-yellow spots and silvery dots were entirely absent." Here then within two years, two names were given to the peculiar aberration with the orange spots on the underside of the hindwings quite absent; but everyone who has collected European butterflies at all widely, will know that there appear to be intermediate forms, in which a pale yellow remnant is all that is left of the sometimes strongly-developed orange markings.

If one takes the northern margin of the range of this species in Europe—somewhere not far from 54° N. lat., except in eastern Russia where it ascends somewhat in the neighbourhood of the Urals—the form *alcetas*, Hb. (*coretas*, Ochs.), appears to be found only as a very rare aberration. It is noted as very rare in the Wiatka govt. in Russia (Kroulikowsky), in Germany it is recorded once from the Schrey (Hering), and very rarely in the forest of Crummenhagen (Spormann), in Pomerania; it is also reported from Osnabruck, in Hanover (Jammerath), whilst in Posen it has occurred rarely near Kobylepola (Schultz). In Lower Austria, *coretas* occurs singly with *argiades* and *polysperchon* on the Hernstein district (Rogenhofer), but in Switzerland, in the Rhone Valley, in the southern parts of Austria and in certain parts of southern and south-western France it becomes commoner, and here and there forms a separate race, but apparently it is the same insect, and has always been so considered. If Wheeler be right in his statement to us that the so-called Swiss *polysperchon* have also no orange on the underside of the hindwings, and that specimens with orange on the underside of the hindwings are not known in Switzerland, then only *coretas* in both broods would appear to occur in that country, and the *polysperchon* are wrongly so recorded. Staudinger, in his original description of *decolorata*, states that this latter is a form of *coretas*.

The superficial reasons for considering *coretas* and *argiades* the same species are self-evident. Its occurrence as a rare aberration among both the spring and summer broods of *argiades* over a large geographical area; the presence of intermediate forms; the otherwise similar character of the examples (except for the failure of the orange spots on the underside of the hindwings) all point in this direction. Jachontov's hint as to the difference in the size and arrangement of the spots on the underside of the wings wants considering in the light of the heavily-spotted Asiatic examples, otherwise of quite characterised *argiades* form. Rebel has quite recently attempted to prove that the long-held views are correct. Seeing that the original examples of *alcetas*, Hb. and *coretas*, Ochs. come from Austria, it was necessary that Austrian examples of this form should be examined. Baron Schlereth has tested the genitalia of *polysperchon*, *coretas*, and *argiades*, and finds them practically identical. So far then it would appear that *coretas*, as we know it, is not a distinct and separate species from *argiades*.

In Austria-Hungary a still more obsoletely-marked form occurs, viz., *depuncta*, Kirschke. In this, not only has the orange entirely or nearly disappeared from the underside of the hindwings, but the usual black streaks also, the latter being represented merely by the spot in cell 2. This then might be considered, except that the orange is not always quite absent, an extreme form of *alcetas*, Hb. (= *coretas*, Ochs.).

But Jachontov (in Russia) and Oberthür (in France) bring in outside considerations, quite separate from those that characterise *coretas*, Ochs., as an aberration of *E. argiades*, Pall., and which suggest that they are not discussing *coretas*, Ochs., at all. Jachontov states that the insect he is talking about "a *L. argiades*, Pall., differt non solum 'alis subtus maculis rufis nullis' (quod insigne apud Staudinger and Rebel affertur) vel subnullis, sed etiam magnitudine paulo majore, codicula alarum posticarum duplo brevior, pagina superiore ♂ lætius cærulea, tenerius nigro-marginata, punctorum seriei externæ dispositione, qua *L. coratas* cum *L. fischeri* congruit."

Now none of these particulars came within the purview of Hübner or Ochsenheimer, nor have they anything to do with the insect we know as *alcetas*, Hb. = *coretas*, Ochs., *per se*. One asks then, are these characters within the variational limits of *argiades*? Does *argiades* vary in wing-expanse, in the size of the tail of the hindwings, in the tint of the forewings, in the width of the marginal band, in the size and direction of the spots on the underside? We have a good deal of information on this point, which we hope later to publish in its proper place in our *Natural History of the British Lepidoptera*. In the meantime accumulated evidence from all lepidopterists who collect European butterflies would be very useful.

Oberthür makes the following points (not dealt with by Hübner or Ochsenheimer) of the Pyrenean form, which he considers *coretas*. An entirely black upperside in the ♀, and the tail sometimes wanting. One asks whether these characters also vary within the specific limits of *argiades*.

We want definitions to know exactly what we are talking about. But it appears beyond question that whatever insects Jachontov and Oberthür are dealing with, there can be little doubt that *coretas*, Ochs., as we at present know it, is an aberration of *argiades*. It would be interesting if other lepidopterists who believe the name *argiades* is standing for more than one species, *viz.* (1), an ab. of *argiades*, (2) a distinct species, would give descriptions and figure the ancillary appendages side by side with those of undoubted *argiades*.

A somewhat humorous point comes out of this superficial treatment. If the shortness of the tail of the hindwings really is a character in the so-called specific form noticed by Jachontov, it would appear that the character belongs to *argiades*, Pall., for Pallas in his original description says "alis que subcaudatis (ut *Papilio rubi*)" which is, one suspects, something of what Jachontov means by his reference. But the fringe-"tail" of *argiades* is a somewhat shaky characteristic. When will our students of variation, however, take the trouble to learn the alphabet of their study and make a point of working from original descriptions? "There is no royal road to mathematics" nor to the study of variation.

The Genus *Acrididium*.*

By MALCOLM BURR, B.A., F.E.S., F.L.S.

In working out collections of grasshoppers and locusts, especially

* "Sur le Genre *Acrididium* : contribution à l'étude du genre *Acrididium*, Serville, de la famille des Acridiens, Insectes Orthoptères, avec descriptions d'espèces nouvelles," par A. Finot. [*Annales de la Société entomologique de France*, vol. lxxvi (1907).]

of the Old World, orthopterists have always been handicapped by the difficulty in determining accurately the large-winged locusts which are typified by the common *Acridium aegyptium*, Linn.

Serville described a number of species, but confusion was involved by Francis Walker (1870), who divided the genus into two, *Acridium*, Geoffr., and *Cyrtacanthacris*, Walker, and described over a hundred new species in the two genera combined. Walker included all the species at present ranged in *Schistocerca*, Stål. As his descriptions are insufficient, and based upon non-scientific characters, a revision of his types in the British Museum would be a valuable piece of work.

In 1873, Stål reformed the genus in his classical "Recensio Orthopterorum"; the learned Swede neglected Walker entirely, and created a new genus—*Schistocerca*—based on the form of the cerci of the male; the American species fall into this genus and also the notorious migratory locust *S. peregrina*, Oliv., of the Old World. This genus has been ably dealt with by Scudder (1899).

Since the appearance of Stål's work, various authors have published upon this genus, among whom we may mention Bolivar, Brancsik, Gerstaecker, Karsch, Kirby, Krauss and Karny. A very valuable addition to the systematic literature of the genus has recently appeared from the pen of Captain Adrien Finot. The nomenclature of Karsch is rejected, and the much-debated name *Acridium*, Serville, is retained, agreeably to the usage of Stål and Brunner.

The structure and characters are discussed with that conscientious minuteness of detail which characterises all the work of Captain Finot. This portion of the memoir occupies ten pages, and is illustrated by a number of useful diagrammatic sketches. Then follow the descriptions of the species represented in the author's own collection; these number 28, of which one is a species of Walker's, which Captain Finot has been able to identify, and eight are new.

This portion of the work is followed by a synoptical table of all hitherto described species; this alone is a monument of patience, for it was compiled purely from the descriptions, often very insufficient, of the older authors; it includes no fewer than 125 species, the majority from the descriptions of Walker. A second table is appended of the 28 species contained in the author's own collection; needless to say this is a very much more scientific piece of work.

The chief points of synonymy established in this paper, are as follows:—(1) *lineola*, Fabr. = *aegyptium*, Linn.; (2) *tartaricum*, Linn., is a good species, of which *lineatum*, Stoll, is a synonym; (3) *ruficornis*, Fabr., is distinct from *citrinum*, Serv.; and (4) *flavicornis*, Oliv., is provisionally retained as a synonym of *roseum*, de Geer.

As a critical essay upon a difficult genus, this is an important piece of work, and a valuable basis for a future complete monograph of the group, which must include a complete revision of Walker's numerous types in the British Museum.

Malthodes minimus, L., var. marginicollis, Schilsky, a variety new to the British List.

By H. St. J. K. DONISTHORPE, F.Z.S., F.E.S.

I swept a *Malthodes* at Cobham Park, on July 7th last, which I was unable to name satisfactorily, so I sent it to Herr Ganglbauer, who

has returned it to me as *M. minimus* var. *marginicollis*, Schil. My specimen is a ♂. I append herewith a translation of Schilsky's original description of this form: "The black colour in some examples from Herzegovina (von Hopffgarten), and not rare there, extends so that only the borders of the thorax remain yellow; in some examples only the hind corners are yellow, whilst the arched side portions of the thorax always remain yellow. The tibiæ are then also darker, and the first joint of the antennæ alone remains yellow. In this form, confusion with *pellucidus* can easily take place" (Schilsky, *Deut. Ent. Zeit.*, 1892, p. 198).

Variation in Lepidoptera—A Criticism.

By J. W. TUTT, F.E.S.

We have before us the report of the Lancashire and Cheshire Entomological Society, for February 17th, in which it is stated that Mr. W. Mansbridge read a paper entitled "Variation in Lepidoptera," in which he "enumerated the different classes of variation as generally understood by lepidopterists, and referred especially to a phase of variation which has not evoked the amount of interest its importance warrants, *viz.*, colour changes from yellow or ochreous to red or brown, and modifications of these. The author considered these variations as proceeding upon parallel lines to melanism, and probably arising in a similar way, (1) by variation from a commonly occurring form in the Darwinian sense, and (2) by mutation or sudden leaps in the sense enunciated by De Vries." We had hoped that we could have passed this report over as a poor or inaccurate summary by the secretary, but as Mr. Mansbridge is secretary, and signs the report, one can only assume the report is his own.

We do not notice that Mr. Mansbridge makes any further reference of importance to the particular phase of variation that he specially mentions, *viz.*, from yellow or ochreous to red or brown, and modifications of these, nor does he give any details referring to special species in which these changes occur, nor discuss the changes from an experimental point of view. Probably there were such in his extended paper, but this being so, a mere statement, in his press report, that "this form of variation has not evoked the amount of interest that its importance warrants," appears to serve no useful purpose, nor does Mr. Mansbridge's report suggest that he is aware that considerable attention has been devoted to this phase of the subject. It is now some sixteen years since we wrote, as an introduction to *The British Noctuae and their Varieties*, vol. ii., a comprehensive chapter on "The Nature of Insect Colours, and their Genetic Sequence," occupying no fewer than 16 closely printed demy 8vo. pages, of which more than two-thirds are devoted to the particular phase which, Mr. Mansbridge suggests, has not received attention. Our thesis on the genetic sequence of insect colours, among other things, dealt with two presumably progressive forms of development, *viz.*, (1) through white, yellow, orange, red, brown and black, (2) through white, yellow, green, red (or brown), purple and black.

The subject is then considered in detail, illustrated entirely by species that occur in Great Britain, and by facts that have been accumulated by British lepidopterists. Probably Mr. Mansbridge

considers the facts erroneous, but if so they should be so proved; perhaps he thinks the arguments unsound, then he should disprove them; at any rate the subject which Mr. Mansbridge suggests has not received attention is discussed at length and supported by facts which Mr. Mansbridge possibly could controvert. Yet we wonder whether Mr. Mansbridge has ever read or studied the details.

This, however, may have been an oversight of Mr. Mansbridge's, but has he also overlooked the paper on "Pupal development and Colour of Imago" (*Ent. Rec.*, iv., pp. 313-315) and the long series of papers on "The Nature of Insect Colours" (*Ent. Rec.*, vi.)? In this series, Dr. Riding, Dr. Freer, Rev. C. R. N. Burrows, and others, distinctly proved the existence of the "pigment-factor," which gives us a basis for variation. Then there are "Changes in the Colour of the pupa of *Epinephale ianira* just previous to emergence" (*Ent. Rec.*, viii.). "Development of the wing, wing-scales, and their pigments in Butterflies and Moths" (*Ent. Rec.*, ix.). "On the wing-scales and their pigment in Lepidoptera" (vol. ix.), "Aberrations of *Abra xas sylvata* (*ulmata*)" (*Ent. Rec.*, ix.). "The variation of *Hemerophila abruptaria*" (*Ent. Rec.*, x.), and very many other similar papers. One wonders, too, whether Mr. Mansbridge has missed Dr. Mayer's able work. If Mr. Mansbridge has missed all this, is he justified in saying that this particular phase of variation has not evoked the amount of interest its importance warrants? If he has studied these, then we would ask whether, in view of the great importance of the subject, Mr. Mansbridge has in any way attempted to fill the lacunæ that those of us who have done at least something know to exist?

When we come to the statements of Mr. Mansbridge's paper, one wonders what he means. He states that he considers that "the variations from yellow or ochreous to red or brown and modifications of these proceed upon parallel lines to melanism, and probably arise in a similar way (1) by variation from a commonly-occurring form in the Darwinian sense, (2) by mutations or sudden leaps in the sense enunciated by De Vries."

On these points we should like to ask a question—In what way does melanism arise? Mr. Mansbridge gives the answer. (1) "From a commonly-occurring form in the Darwinian sense." But does not this beg the whole question? What we want to know is—what gives rise to the commonly occurring form that becomes melanic? When we know this we shall begin to know where we are. (2) "By mutations or sudden leaps in the sense enunciated by De Vries." We should like to have some credible evidence on "sudden leaps" that have achieved the ultimate end of producing "melanic" races, "brown" races, or "red" races, from yellow or ochreous specimens arising *per saltum* as aberrations.

Mr. Mansbridge duly sets "aside the first as more or less affecting all species," and then it is stated that "he showed how, practically, all definite melanic forms, falling in the second class, of which we have records, have, when first noticed, been of very local occurrence, as the majority still are, a few only having spread, in comparatively recent times, over large areas, and he noted, when this has been the case, that the particular species, e.g., *Tephrosia bimaculata* var. *delamerensis*, *Amphidasys betularia* var. *doubledayaria*, *Hybernia marginaria* var. *fuscata* and *Diurnea fagella* black var., are common, and generally

distributed so that transported specimens could easily continue their race wherever they might be carried."

One learns from this not over-clear statement, that the melanic forms noted by Mr. Mansbridge, fall in his second class, *i.e.*, that the *T. var. delamerensis*, *A. var. doubledayaria*, *H. var. fuscata*, and *D. fagella* black var. have arisen by "mutations or sudden leaps." We should like to know whether Mr. Mansbridge has any evidence that any of these varieties originated by sudden leaps, and whether he thinks the statement "that all definite melanic forms . . . have been, of local occurrence, when first noticed," is satisfactory or sufficient evidence of the assumed facts? We wonder whether Mr. Mansbridge would be surprised if lepidopterists wanted more definite data before accepting such a sweeping generalisation that these varieties originated by "mutation," as understood by Mr. Mansbridge. We are under the impression that we first collected together the earliest notices that appeared on the variation of these melanic forms in our work *Melanism and Melanochroism in British Lepidoptera*, pp. 8 *et seq.* (particularly pp. 12-17), and, as we are not aware of any earlier record than these, we assume that Mr. Mansbridge has based this generalisation on the facts as there stated, or the same obtained elsewhere. If there are other facts known to Mr. Mansbridge and not to us, our opinion might, of course, be considerably modified, but, if not, then Mr. Mansbridge appears to us to be making a marvellous assertion on very slender and treacherous grounds.

Again, if these forms have all increased by sudden leaps ("mutations" is evidently the correct thing!), how does Mr. Mansbridge explain the intermediate forms that we have seen in abundance of both sexes of *Tephrosia crepuscularia* (Mr. Mansbridge's *T. biundularia*), *Hybernia marginaria*, and *Diurnea fagella*. Does Mr. Mansbridge really think the specimens of these species are either ochreous or black? If so, he cannot know much of the species? If not, well, then, where does the Kangaroo habit come in?

Also, if these melanic species, as Mr. Mansbridge asserts, have been formed by leaps ("mutations"), how does he explain the necessity of "transported specimens" to "easily continue their race wherever they might be carried"? Surely "black specimens" can leap into existence as well at one place as another, and, this being granted, the carrying is superfluous. We may note, too, that "carrying" is a good term for the means of spreading ♀s of *Diurnea fagella* and *Hybernia marginaria*; as we know them these might want much carrying.

Having given us the opinion that these particular melanic races are the result of "mutations," we come to the general statement, that Mr. Mansbridge "broadly classes all instances of melanochroism, and leucochroism as Darwinian variations," and "all cases of melanism and albinism as well as yellow to red, or red to yellow, and similar changes where the break is sudden, as mutations or De Vriesian variations."

Leaving De Vries out of the question, we wonder what this means. Are all the slightly shaded, much shaded, completely fuscous, and black specimens of *Hybernia marginaria*, melanic, and all equally the result of leaps, just as far as the individual specimen has got, or are the intermediate ones produced "as Darwinian variations" (!) whilst the uttermost ones are produced by "mutations"? If this is the idea, we wonder how it is done.

Leaving this question of melanism, Mr. Mansbridge has, in his further statement, given much food for thought. He considers "all cases of change from yellow to red, or red to yellow, and similar changes where the break is sudden as mutations," *i.e.*, that those variations that are most effective in their appeal to the human eye are "mutations," and those that are less so are "Darwinian variations," and herein the nakedness and poverty of argument, and want of appreciation of the facts lie bare. Is it at all necessary to assume that the difference between a yellow hindwing and a red hindwing, in *Arctia caia*, is greater, biologically, than between an ordinary typical *Acidalia virgularia*, and its suffused London form, or that a yellow-spotted aberration of *Anthrocera trifolii* has a greater biological significance than say the difference in the colour of ♂ *Spilosoma mendica*, compared with that of the ♀? Do the eggs from a yellow-spotted ♀ of *Anthrocera trifolii*, or of a yellow hindwinged *Arctia caia*, or a suffused *Abraxa sylvata* (*ulmata*) of necessity produce progeny with "yellow spots," "yellow hindwings" or "suffused" wings respectively? Do they produce necessarily their own "leap"-kind to perpetuate the marvellous biological wonder? We know well they do not.

We would like, without impertinence, to again refer Mr. Mansbridge, not only to our remarks (*Brit. Noctuae*, etc., ii., pp. ix *et seq.*) and the suggestions that arise from a study of the advance of ochreous and yellow forms to red or brown, in *Colias edusa*, *Gonepteryx cleopatra*, *Humia crataegata*, *Arctia caia*, *Nemophila plantaginis*, *A. villica*, *Coenonympha pamphilus*, *C. darus*, *Epinephele tithonus*, *Callimorpha hera*, *Satyrus semele*, and many other species, but we would like to call his attention to the retrogressive condition arising, possibly, in an entirely different direction in *Callimorpha dominula*, *Anthrocera filipendulae*, *A. trifolii*, *A. lonicerae*, *A. purpurealis*, *A. achilleae*, *Catocala nupta*, *Cosmotriche potatoria*, *Pachygastria trifolii*, *Eutricha quercifolia*, and a whole host of Noctuids and Geometrids. We would ask for a fair criticism of the facts known and theories advanced; these haphazard statements which mean nothing, and lead nowhere, are getting wearisome.

Our older and well-informed lepidopterists will doubtless say, why treat so small a matter so seriously. My answer is that, if only our older and well-informed lepidopterists were readers of the entomological magazines, it would indeed be unnecessary, but year by year new and young members come in, who, of necessity, are ignorant of the work that has been done, and yet are anxious to learn. There is a time when oft-repeated errors, erroneous opinions and ill-judged statements, sink as facts into the minds of those who know no better, and one learns very early in the educational field, that it is more difficult to eradicate an error, than it would have been at first to teach the truth. Hence it becomes necessary, now and again, to ask those who, in their turn, would profess to teach, to themselves make sure of their ground, to remember that assertion does not necessarily include accuracy either in fact or argument, that what the best know is but a trifle, and that to teach others even a part of that trifle, one must make sure of one's own facts first. It appears to be unfortunate that the few reprints that were at the time made of the essays on "The genetic sequence in Insect Colours," and "Secondary Sexual Characters in Lepidoptera," and which appeared as introductory chapters to vols. ii and iii of *The British Noctuae and their Varieties*, were so soon dispersed.

They unfortunately appear to be largely overlooked owing to not being prominent in their present positions; still the facts are in the hands of most lepidopterists, and they can still be got at by those who will.

The "British List."

By W. E. SHARP, F.E.S.

Mr. Day, in his interesting record of the reappearance in Carlisle of the long lost *Brontes planatus* (not "*Brantes phanatus*") (*Ent. Record*, xx., 62) remarks—"whether casual immigrants of this kind should be considered as British insects is doubtful, unless they breed and establish themselves, when there can be little reason for not admitting them to our list."

Such a record and the comment thereon, perhaps not unnaturally, suggest reflections as to the true meaning and inwardness of this "British List" whose validity and content appear to many of us a matter of considerable interest and importance, and perhaps I may be pardoned if I venture to discuss a little more at length the merits of the case, and the definition of the term a little more fully.

Now, it would seem that there are two quite distinct senses in which the "British," or indeed any list of a circumscribed faunistic area, may be used, two ideas which the same term connotes, hence the possibility of difficulty or confusion in its application.

One constantly hears discussed the claim of some doubtful native to a place in this exclusive "List;" indeed the entomological public is sometimes tacitly invited to constitute itself into a kind of court of appeal on the right of entry of such "destitute aliens" of the *Insecta*. One has heard suggestions of a "time limit," a fixed number of years, after which, should the applicant have proved himself capable of an honest and respectable livelihood in these islands, letters of naturalisation should be granted.

Now, I venture to think that, in a true or really scientific sense, no such naturalisation is possible, admission must depend on a lineage vastly more ancient; for I would define as "British" in the faunistic sense, only that assemblage of insects which had become established here by exclusively natural means, those in which man, with all his activities, his ships, and his commerce, had no part. The test would be original natural establishment, and, by establishment, I would mean survival over such a space of time as would include all possible climatic vicissitude. In this sense I should regard the claim of such a species as *Rhynchites bacchus*, even if it could be demonstrably proved to have been extinct here for fifty years, much more admissible than that of the too familiar *Blattæ* of our kitchens, or of many of the ubiquitous *Nipti*, *Bruchi*, and *Cryptophagi* of our granaries. Most certainly would I repudiate the idea that the "British List" should be in any degree a kind of census of the entomological population of the kingdom on the date of its publication. On the contrary I hold the "British List" of science to be practically a closed book, closed with a few possible exceptions before the historic period, closed long before the first Phœnician mariner sighted the unknown Cassiterides.

That such an original establishment of the British fauna took place, from whatever quarter the immigration may have come, during the period which elapsed between the end of the glacial age and the

complete insularity of Great Britain, is, I believe, generally admitted, and it seems probable that the area was then colonised to its fullest capacity—that is, till a point of equilibrium was reached between the forces of immigration and the antagonistic influence of the competition of already existing forms, limitations imposed by flora, and so on. Also that, since complete insularity was effected, but few additions have been made by purely natural means. Species, no doubt, over a continental area are continually altering, extending, or reducing their range—and the Channel would offer no insuperable obstacle to such extension, but, for effective occupation, although the means may be quite natural, the occasion would probably be due to human agency, such as interference with natural flora—thus the introduction of such trees as our common elm, larch, or lime might have afforded the opportunity for the quite natural establishment here of species not included in the original immigration, but the insects, no less than the trees, can hardly be considered as *naturally* British.

In this sense then, the "British List" appears as some ancient and even dilapidated document not everywhere quite legible, from which some excisions have been undoubtedly made, but in which interpolations are rare and not always authentic.

Now to this view it may be objected that humanity and all its works are merely part and parcel of the natural order. And this must be admitted. The operations of *Homo sapiens* equally with those of *Formica sanguinea* are certainly an integral part of the scheme of nature, and, if the influence exerted by one on a *Lomechusa* be simply natural, no less natural in its strictest sense must be the influence of the other on the migrations of a *Bruchus*. But from this strictly logical view of the matter we all with one accord depart. In all Philosophy and all Literature, man, civilised or not, is considered as a force outside of, indeed, antithetical to nature, and the natural and artificial orders held as essentially distinct.

Again it may be urged that, in asking for proof of strictly natural immigration of every species before granting it a certificate as "British," we are demanding the impossible. That may be so, but the difficulty of recognition in each instance need not obscure for us the validity of the principle. All we can ever hope for is circumstantial evidence more or less strong, and any list must be to a great extent provisional.

But there is another sense in which this term "the British List" may be used, and perhaps more commonly is used. That I may call its practical sense. This is the list, frankly empirical in its scope, which we need for the compilation of our manuals and county faunas, the list by whose aid we space out our cabinets, the list which decides whether we are justified in giving ten shillings for an indifferent specimen of an insect of which we can buy "without guaranty of British origin" a perfect example for twopence.

The need of such a document is obvious; it is also obvious that it is demanded principally by the accident of our insularity. In the same sense, no such French or German list would be possible, and one wonders how the entomological citizen of Chicago, or Memphis, solves the difficulty. The "U.S.A. list" would probably be more comprehensive than that of Europe, and exclusive "State Lists" seem impracticable.

For myself, I think I should feel inclined to admit into this

practical, as distinguished from the scientific, "British List" (except, of course, for purposes of the market) any insect included in the north-western extension of the Palaearctic fauna which could give some evidence of British birth, and, as for those quasi-domesticated species — *Tineinae*, *Blattae*, *Nipti*, the denizens of our houses and granaries—I should deny them any nationality at all. These are the gipsies of the *Insecta*, vagabonds who have lost all trace of ancestral home or pedigree, and who might have an equal place in all the cabinets in all the countries of the world.

Otherwise, each case must be judged on its merits, if I find *Carabus auratus* alive in Covent Garden, I should not, therefore, give it a place among the *Carabi* of a British collection, but if, to revert to the occasion of these *obiter dicta*, I should be so fortunate as my friend Mr. Day, and discover *Brontes* under similar circumstances, the vacant space over that name in my "British" collection of coleoptera would no longer remain untenanted.

The connection between Ants and Lycænid larvæ.

By J. W. TUTT, F.E.S.

The connection between ants and Lycænid larvæ appears only recently to have become known to the greater number of British lepidopterists, many of whom were somewhat surprised at the recent discoveries of Messrs. Rayward and Frohawk, that the larvæ of some of our common native species of Lycænids were accompanied by ants, who milked them as it were much as they milk aphides.

Our recent studies of the Lycænids, and the search we have had to make through the literature of the subject, has resulted in the discovery of facts, which, recorded at odd times, and in little known magazines, are really very remarkable and startling in their character.

The association of Lycænid larvæ with ants is so wide-spread and general a habit, that it is only our ignorance that prevents us from asserting that the larvæ of every true Lycænid butterfly is accompanied by ants. The habit is recorded as occurring in every quarter of the globe in Europe, Asia, Africa, America and Australia.

The fact that ants were to be found in companionship with the larvæ of "blue" butterflies has been on record for more than 130 years, and was referred to by Esper and his contemporaries, but none of them seemed to have guessed why they so consorted. In 1867, Guenée discovered certain glands in the larva of *Lampides boeticus*, one in the centre of the dorsum of the 7th abdominal segment, and two others, one on either side of the 8th abdominal segment, but he did not connect the glands with the visits of the ants to the larvæ. A full translation of Guenée's paper is published (*Nat. Hist. Brit. Butts.*, ii., pp. 348-350). Similar glands were then discovered in 1869, by Goossens, in *Celastrina argiolus*, and a translation of his observations are published in detail (*op. cit.*, p. 445), but it was not until 1877 that Edwards connected the glands with the ants, and discovered that the ants visited the larvæ of *Celastrina pseudargiolus*, in order to obtain the sweet secretion of the dorsal gland on the 7th abdominal segment. The uses of those on the 8th abdominal remain somewhat obscure. A

full account of Edwards' discovery and experiments are also detailed (*op. cit.*, pp. 445-447).

This important discovery led to a great many observations being published (*a*) on the symbiosis of ants and larvæ, and (*b*) on the habits of the ants and larvæ. A series of the records alone occupies considerable space (*op. cit.*, pp. 323-324), but the connection of *Plebeius aegon* with *Lasius niger*, of *P. argyrognomon* with *L. alienus* and *Formica cinerea*, *Agriades corydon* with *Lasius* (*Formica*) *niger*, *F. rufa*, and more recently with *F. flava* (by Rayward), of *A. bellargus* with *Lasius niger* and *L. flavus*, of *Polyommatus damon* with *L. niger*, *P. icarus* with *L. flavus*, and many other species have been well substantiated, and Rayward's confirmation of the earlier records is exceedingly useful, especially as his observations are more detailed and careful than those of some observers.

Some two years ago we published a chapter on "The Association of Ants with Butterfly larvæ" (*Nat. Hist. Brit. Butts.*, i., pp. 30-37), and detailed at length some of the observations and experiments that had been published in America, India, Australia, etc., particularly the remarkable observations made by Edwards on the larvæ of *Plebeius* (*Rusticus*) *melissa*, a species closely allied to our *P. aegon*, and the still more amazing discoveries of de Nicéville, Green, Doherty, and Mrs. Wylly, who note, not only the milking-habit, but aver that in some species the larvæ are herded in special shelters built by the ants, and are driven out at night to feed, being brought back to their shelters each morning. Some of the details are certainly hardly credible, yet they are vouched for by some of our leading field entomologists.

The discoveries of Rayward and Frohawk have led to a great amount of interest being shown in the subject by British lepidopterists, the matter having been also brought to the front by the recent investigations of Donisthorpe on the connection between ants and their guests, etc. In our study, therefore, of the habits of Lycænid larvæ, it became necessary to look up *de novo* the literature of the subject, and condense it for our readers. This we have done in our chapter "Family Habits of Butterfly Larvæ—The Lycænids" (*op. cit.*, pp. 75-80), but, although, on the whole, we are satisfied with the result, and now have, in an exceedingly easily accessible form, the facts (and references to the literature) of the subject, arranged separately as to the observations made in Europe, Asia, Australia, and America, respectively, yet there are two or three species about which the material is exceedingly scanty, in which British collectors are particularly interested. These are *Everes argiades* (Edwards notes the American form *comyntas* as being attended by ants), *Aricia astrarche*, which Harrison (*Ent. Rec.*, xvii., p. 268) says is attended by ants, without, however, mentioning the species, *Cyaniris semiargus* and *Cupido minima*, about which, at present, records appear to be wanting. We wonder if any of our readers will be in a position to observe the larvæ of these species in the coming summer. If so, we should be exceedingly glad to hear of any facts bearing on the subject of their symbiosis with ants.

Melanophthalma truncatella, Mannh., a new British Beetle.

By NORMAN H. JOY, M.R.C.S., F.E.S.

This species resembles *M. fulvipes*, Com., but differs in the following details. The colour is entirely testaceous (in *M. fulvipes*, the breast and abdomen are always, and the elytra are generally, fuscous). The first joint of the club of the antennæ is longer, being distinctly longer than broad; the thorax is rather broader in proportion with the elytra; the elytra are less rounded at the sides, and have no shoulder callosities; it is also slightly larger.

I have two specimens of *M. truncatella* which are labelled "Norfolk, August, 1904," which I must have taken either at Sherringham or Wells, and I have seen one from Lowestoft belonging to Mr. Newbery. Ganglbauer records it from north and middle Europe, whereas he records *M. fulvipes* from the Mediterranean region. Canon Fowler is probably right in saying that the latter does not occur further north than the London district, but perhaps *M. truncatella* occurs with it in the south.

VARIATION.

SMALL EXAMPLE OF *PARNASSIUS APOLLO*.—I send as a curiosity a dwarfed ♀ specimen of *Parnassius apollo* which was bred in 1906 from ova of the previous year. The rest of the brood were of normal size, indeed, some of them were particularly fine examples. This particular individual has a wing expanse of about 56mm., with a distinct, but small, red spot in the usual position in the black spot on the costa of the forewing.—W. H. ST. QUINTIN, F.E.S., Scampston Hall, Rillington, York.

NOTES ON COLLECTING, Etc.

SIREX NOCTILIO IN YORKSHIRE.—In the November number of the *Entomologist's Record*, p. 265, Mr. J. Anderson refers to the capture of a specimen of *Sirex juvenis*, F. (corrected in the February no., p. 63, to *Sirex noctilio*, F.). I have a specimen, which I take to be the same species, captured in the vicarage at Cowthorpe in this county last September, and which it may be well to place on record.—W. H. ST. QUINTIN, Scampston Hall, Rillington, York. [The specimen has since been determined as *S. noctilio* by the Rev. F. D. Morice.—ED.]

ARGYROLEPIA (PHALONIA) BADIANA LARVÆ IN SEEDHEADS OF *ARCTIUM LAPPA* ON GREENWICH MARSHES.—In working through back vols. of the *Entomologist* for references to incorporate in *British Lepidoptera*, I have just observed a statement (vol. xxxviii., p. 276) by my friend, Mr. E. Banks, that, "in Tutt's *Practical Hints*, pt. i., pp. 83-4 (1901), we read "The seedheads of burdock, *Arctium lappa*, should be collected in September for the larvæ of *Argyrolepia badiana*, which pupate among rubbish at the roots of the plant, this hint being doubtless based on Mr. Machin's note, which is quoted above." I should like to suggest that there is considerable doubt about the hint being based on Machin's note. The species, 25 years ago, was, in the palmy days of Greenwich Marshes, one of the most abundant species there, and Messrs. Herbert E. Page, and Edwin Brown, then lads at school, used to collect the larvæ for me year after year in considerable numbers.

The larvæ always left the seedheads for pupation. I dare say the species occurs now on the waste areas there wherever burdock grows. Any way, though for the purpose of *Practical Hints* I should have been glad to have used Machin's note, I knew all about the larval habits of *A. badiana* in those days, and remember them still. I believe most of the authorities say it feeds in the stem which is, I believe, quite erroneous.—J. W. TUTT.

NOTES ON BRITISH RECORDS OF SIREX JUVENCUS, F.—On looking over the *Entomologist's Record*, and carefully reading the note of Mr. Joseph W. Anderson, I think it well to record the particulars concerning three specimens of *Sirex* that I have in my collection. One taken on the London Fields, Hackney, on July 20th, 1891, and brought to me damaged after being smoked to death, and kept in a match-box for some days. The second taken at Eltham by my late brother Joseph Clark, September 27th, 1896, and the third taken in Abbots Wood, July 7th, 1903. All these specimens have metallic blue-black bodies. Two have blue-black antennæ, but the one taken on the London Fields, seems to have black antennæ. Many entomologists have seen them, and have always called them *Sirex juvenus*. It seems strange that the date of occurrence and the districts are so widely separated. Compare Mr. Joseph W. Anderson's note, *Entomologist's Record*, vol. xix., p. 265, and mine as above.—J. A. CLARK, F.E.S., 57, Weston Park, Crouch End, N.

NOTES ON LIFE-HISTORIES, LARVÆ, &c.

OVUM OF OCHSENHEIMERIA VACCULELLA, F.-R.—In August, 1906, I enclosed two or three females of this species from Richmond, Surrey, in a box with some *Poa annua*. Many eggs were laid, some along the inner face of a dried leaf near the base, others in the sheaths of the lower leaves close to the root of the grass. They were more or less in pairs, and touching each other. Colour very pale ochreous, and somewhat shining. Fusiform in shape, more than twice as long as broad, with the micropylar pole truncated, usually obliquely, and the opposite pole rounded or bluntly pointed. Sometimes the eggs appear to be slightly flattened. Length 0.55mm. Width, in widest part, 0.23mm. Irregular coarse furrows or wrinkles run from end to end of the ovum. Sometimes these rather deep furrows coalesce, or they form a sickle-shaped bend in their course, and then continue. At the micropylar pole are some large, more or less kite-shaped, cells, but weakly-marked, and in the centre of these are about eight small and strongly marked cells, which enclose the micropyle.—ALFRED SICH.

OVUM OF BORKHAUSENIA PSEUDOSPTELLELLA, Stt.—Colour very pale, ovoid in shape, the long axis about 0.55mm., the two others nearly equal, about 0.37mm. The micropylar pole, which is flattened, is larger than the opposite rounded pole. The sculpture consists of about twenty longitudinal grooves which run from pole to pole. Towards the micropylar area the ridges between the grooves become rather sharp, and they are crossed by slight secondary ridges. The result is that slight irregular elevations are formed which give the egg a rough appearance at the top. The rosette is composed of seven or eight elongated cells of much the same size and shape, and having their outer extremities

rounded. Eggs laid in box. [Described August 24th, 1906. Female, from Chiswick.]—ALFRED SICH.

SCIENTIFIC NOTES AND OBSERVATIONS.

THE DRINKING-HABITS OF THE MOTHS OF THE GENUS *CATOCALA*.—I have just seen your note in the current number of the *Ent. Rec.* (vol. xix., p. 263) concerning the drinking habit of *Catocala nupta*. Until this summer, this habit of the *Catocala* species was not known to me, but I suppose it is a normal one. *Catocala conversa* swarmed in thousands in the Seb dou district in late June and July, and I several times saw it drinking at springs and on damp patches. One day in particular, July 18th, there were numbers of them drinking at a spring at the foot of the mountain of Sidi Yahai, 14 kilometres west of Seb dou. This spring fills a small lake in winter-time, but in summer the water is conducted away for irrigation purposes. The lake-bed remains damp, and, sitting on it, in full daylight, were thousands of *C. conversa* drinking. Waterplants grow in the spring itself, and the *C. conversa* were sitting also on the leaves of these plants, drinking the running water. They would often settle right in the water and were sometimes carried away by the stream and drowned. When disturbed they would fly off in clouds. The ilex trees in the district were stripped by the larvæ, all the first growth of leaves being eaten, and, in many cases, the old winter-leaves as well, leaving the trees bare, but after the larvæ have spun up, the trees throw out a fresh crop of leaves, and by autumn they look all right again. Many larvæ spin their cocoons amongst the old leaves of the trees, others drop, and spin up amongst dead leaves or in bushes. The ilex trees have a bad time in Algeria, but they are evidently used to it. *Catocala conversa* is the chief enemy, but there are many others, such as *C. nympha goga*, *C. dilecta* (which produces some fine dark forms), *C. promissa*, a very large Geometrid, rather local but in tremendous quantity where it occurs, *Bithys* (*Thecla*) *quercus* and several Noctuids. *Porthetria* (*Lymantria*) *dispar*, too, is fairly common on ilex, and probably sometimes does as much harm as *Catocala conversa*.—H. POWELL, F.E.S., 7, Rue Mireille, Hyères. November 20th, 1907.

CROSS-PAIRING OF ANTHROCERIDS.—I was interested also on reading your record (*anteà*, vol. xix., p. 260) of the pairing of *Anthrocera oechsenheimeri* with *A. carniolica*. I obtained last summer, 1906, *A. achilleae* paired with *A. purpuralis* (*minos*).—H. POWELL, F.E.S., Hyères. November 20th, 1907.

EARLY CHINESE DESCRIPTION OF THE LEAF-INSECT.—“Yuen-kien-lui-han,” a Chinese encyclopædia completed in 1703, tom. cdxlvi., fol. 9, b, has the following quotation from the “Tau-hwang-tsah-luh,” written c. ninth century: “In Nan-hai, a peculiar manner of bees (or wasps) live on the *kan-lan* tree (*Canarium pimela* or *C. album*). They look as if this tree’s leaves were grown with hands and legs, where-with to grasp branches, and so deftly adpress themselves thereto that they are quite indistinguishable from the foliage. Therefore, to collect them the southern people used to fell the tree first and await the withering and falling of its leaves; and only then they are enabled to discern and gather the insects, which they employ as philter.” Nan-hai, literally, “Southern Sea,” was anciently the appellation of a

province, the present Kwang-tung, but sometimes it was applied to the Indian Archipelago (Bretschneider, *Botanicon Sinicum*, part iii., p. 579). But for specifying them as bees or wasps, this Chinese account of the mimetic articulate would appear fairly to tally with that of the leaf-insects (*Phyllium*). Probably it is a very early, if not the earliest, description of these Orthoptera.—KUMAGUSU MINAKATA, Tanabe, Kii, Japan. November 14th. [From *Nature*, no. 1991, vol. 77, p. 173 (December 26th, 1907).]

CURRENT NOTES.

An interesting paper on "The Sexual Dimorphism exhibited in the antennæ of Lepidoptera," by Dr. Fritz Nieden, and illustrated by 57 figures, has been appearing in the *Zeitschrift für Wissenschaftliche Insektenbiologie*, vol. iii. (1907).

Mr. W. E. Nicholson, of Lewes, who seems now to have quite forsaken the study of lepidoptera for that of mosses, has just published a most important "List of the Mosses of Sussex" in the *Hastings and East Sussex Naturalist*, vol. i., pp. 79-110. In the same volume (p. 127), the Rev. E. C. N. Bloomfield records *Leucania straminea*, *Senta maritima*, and *Calamia phragmitidis*, from Rye, and Mr. Adkin gives (p. 121) an account of "*Tortrix pronubana* in Sussex."

The Entomological Society of London is taking quite a new departure, in holding a *Conversazione* early in May next. A business committee has been appointed, and a Guarantee Fund has already been subscribed for the purpose of insuring the Society against loss. Entomological exhibits of interest are requested in order to enhance the success of the occasion. Information can be obtained from Mr. H. Rowland-Brown, 11, Chandos Street, Cavendish Square, W.

For the purpose of the *Conversazione*, the First Commissioner of H.M. Works has most kindly placed the Theatre, Great Hall, and other rooms of the Civil Service Commission at the disposal of the Society, so that the *Conversazione* will be held at Burlington Gardens on the evening of Friday, May 15th, and not as previously announced to Fellows. Full particulars will be published during the current month, and intending exhibitors are requested to communicate with the Hon. Secretary, H. Rowland-Brown, 11, Chandos Street, Cavendish Square, W.

Cook has determined the foodplant of *Epidemia epixanthe*, describes (*Can. Ent.*, xl., pp. 85 *et seq.*) its method of oviposition on *Vaccinium macrocarpus*, and states that the species hibernates in the egg-stage.

Hampson gives a list (*Can. Ent.*, xl., p. 102) of the Noctuids collected by Mrs. Nicholl on her successive trips to Alberta, British Columbia, and the Washington Forest reserve, in the years 1904, 1905, and 1907. *Protagrotis nicholli*, *Miselia carbonifera*, *Plusia orophila*, are described as new species.

The visit of the South-Eastern Union of Scientific Societies to Woolwich last June determined the local committee to issue "A survey and record of Woolwich and West Kent." The volume has grown to considerable size, and falls under the heads of (1) Geology (Sectional Editor, W. Whitaker, B.A., F.R.S., F.G.S.); (2) Botany (Sectional Editors, J. F. Bevis, B.A., B.Sc., and W. H. Griffin);

(3) Zoology (Sectional Editor, J. W. Tutt, F.E.S.); Archæology (Sectional Editor, W. H. Evans, A.R.C.A.); Scientific Industries (Sectional Editors, T. A. Ingram, M.A., LL.D., and J. Stuart Ker, B.Sc., A.M.I.C.E.); Photography (Sectional Editor, J. Borthwick Panting, F.R.P.S.); Work waiting to be done (C. H. Grinling). The Zoological Section is a very extensive one, consisting of Mammals, Reptiles, Amphibians, Fishes, Birds, False Scorpions, Insects, and Molluscs, and to the compilation of these lists almost all local zoologists of importance have contributed.

The section on Insects has been compiled by J. W. Tutt, F.E.S., and H. J. Turner, F.E.S., from records by B. W. Adkin, F.E.S., Robt. Adkin, F.E.S., Hope Alderson, H. W. Andrews, F.E.S., F. Ashby, F.E.S., W. Barnes, P. J. Barraud, F.E.S., W. S. Bolas, B. A. Bower, F.E.S., G. B. Browne, J. A. Butterfield, F.E.S., F. M. B. Carr, G. C. Champion, F.Z.S., F.E.S., (Miss) A. M. Cochrane, C. W. Colthrup, F. W. Cowham, F.E.S., Stanley Edwards, F.Z.S., F.L.S., F.E.S., C. Fenn, F.E.S., The Rev. Canon Fowler, F.L.S., F.E.S., A. H. Jones, F.E.S., L. W. Newman, F.E.S., H. E. Page, F.E.S., A. Russell, F.E.S., H. J. Turner, F.E.S., J. W. Tutt, F.E.S., W. West, etc. The volume, a limited number of which only is being published at an almost nominal price, is to be obtained from Mr. A. Thomas, Town Hall, Woolwich.

A tenth edition of *The London Catalogue of British Plants*, by Frederick J. Hanbury, F.L.S., F.E.S., assisted by a number of botanical experts, and published by George Bell & Sons, has been issued. The excellence and value of *The London Catalogue* are too well known to require further notice. One need only note that this edition is interleaved, a very useful innovation, which will enable one to enter his or her own notes, localities, etc.

An extensive paper "On the Variability of the Wing-colouring of *Lymantria monacha*," by H. Auel, is being published in the *Zeitschrift für wissenschaftliche Insektenbiologie*, vol. iv.

A most interesting meeting of the Entomological Club was held on March 19th, at 6.30 p.m., at Wellfield, 4, Lingard's Road, Lewisham, when Mr. R. Adkin was the host. Tea was served by Mrs. and Miss Adkin, after which the collections and the library of the host were inspected, and various entomological matters discussed. At 8 p.m. a very jolly party of members and friends sat down to supper, including, among others: Prof. T. Hudson-Beare, Messrs. B. Adkin, H. Rowland-Brown, H. St. J. K. Donisthorpe, F. Enock, A. H. Jones, T. Hall, A. Harrison, H. Main, G. T. Porritt, R. South, A. Sich, E. Smith and J. W. Tutt. At the business meeting Mr. H. Rowland-Brown was elected full-member in the place of Mr. A. J. Chitty, deceased.

Cloth cases (1s. 9d., post free) for binding the second volume of "A Natural History of the British Butterflies," will be prepared and lettered "British Butterflies, Vol. II"; or, "British Lepidoptera, Vol. IX," as desired, for those subscribers who apply at once direct to 119, Westcombe Hill, Blackheath, S.E.

One wonders that there is any vegetation to be found in North America. The woes of the agriculturists and the nostrums of the economic entomologists are funereal in their aspect and most alarming in the impression they leave on the human mind. After capturing about nine-tenths of the space available in the entomological maga-

zines of Canada and the United States, and publishing separate bulletins in every State as a branch of the work of the agricultural experimental stations, their troubles and remedies are still crowded out, and new means of publication have constantly to be found. The newest addition to these publications is the *Journal of Economic Entomology*, and we have only room to notice that, among so much published and republished material in this branch of work, this *Journal* appears to be among the best. One item worth noting is a paper on "The Relation of Temperature to the Hybernation of Insects," by E. D. Sanderson, a subject which was discussed at length in the *Ent. Record*, vols. vii and viii. This paper is well worth reading.

The Abbé de Joannis (*Bull. Soc. Ent. Fr.*, 1908, p. 45) describes new aberrations as follows:—*Melitaea phoebe* ab. *confusa*, *Ephyra punctaria* ab. *radiomarginata*, *A. prunaria* ab. *nigrolineata*, and *Farias chlorana* ab. *flavimargo*.

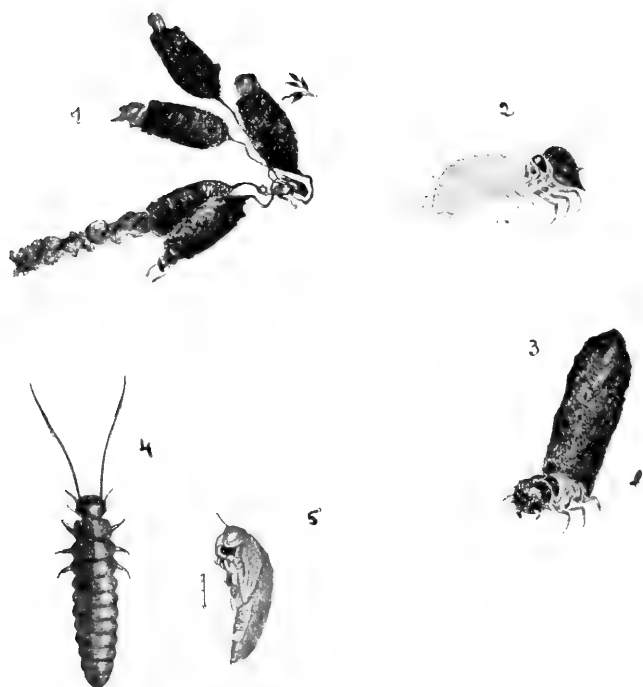
Among a very varied and interesting lot of papers in the *Thirty-eighth Annual Report of the Ent. Soc. of Ontario*, 1907, is an account (pp. 99 *et seq.*) of a most amazing abundance of the larvæ of *Peridroma saucia*, at Leamington, Ontario, at the end of July, 1907. They devastated the tobacco and tomato crops, and Mr. Moore "counted as many as 250 caterpillars on a single plant." This is the way to get a series. One would like to know the size of that tomato or tobacco plant, and the size of the larvæ. If it were a small plant and the larvæ well-grown, it would be bad for both larvæ and plant; but if the larvæ had just left the egg, well, we have ourselves seen 300 larvæ of lots of species on a moderate-sized leaf!

A hybrid between *Gastropacha tremulifolia* ♂ and *ilicifolia* ♀ has been reared by F. Lenz, and is named *Gastropacha* hybr. *veris* (*Berl. Ent. Zeits.*, lii., p. 107).

It is with the greatest regret that we have to record the death of two more British entomologists. Fredk. C. Lemann, one of the small band of British lepidopterists who have hunted and studied the European butterflies in their native haunts, and who has well-maintained the reputation which its members have for accuracy and keenness of observation, was attacked by influenza, which rapidly developed lung trouble, and ended most unexpectedly in death on March 23rd. An accomplished linguist, he had travelled widely in most parts of Europe, and his charming companionship and knowledge of things added zest and interest in the rambles which he undertook, in company with other British entomologists, into the little known and unworked parts of Switzerland, Austria, Italy, etc., carefully recording details of his work, and handing over his knowledge most generously to anyone who appealed to him for help. His cheerful disposition endeared him to all his friends and companions, and we who knew him best will long find an unfilled gap in the circle of our intimate friends. His best-known work is, perhaps, an excellent translation of that part of Frey's *Lep. der Schweiz*, relating to the butterflies.

The regretted decease of John T. Carrington, the prince of Bohemians among entomologists, has also to be recorded. We hope to give a further notice in our next number.

We shall be exceedingly grateful if any visitors to the continent can send direct to Dr. T. A. Chapman, Betula, Reigate, living ♀s of *Cyaniris semiargus*, or *Everes argiades*.



THE LIFE-HISTORIES OF TWO SUPPOSED ANTS' NEST BEETLES—
EARLY STAGES OF LABIDOSTOMIS TRIDENTATA, L. (1-3) AND PRIONOCYPHON
SERRICORNIS, MÜLL. (4-5).

The Lepidoptera of Ticino—Brugnasco.

By J. W. TUTT, F.E.S.

Next morning, August 2nd, 1907, broke lovely. I had been advised with fine weather to go up, and, with this idea in mind, a start was made to get somewhat higher, and the look round suggested Brugnasco and the slopes and woods beyond. The sun was hot and by 9 a.m. progress was slow as one climbed the steep path, seeing little but an abundance of *Agriades corydon* on the way, whilst here and there *Colias hyale* and *C. edusa* were pulled up suddenly on flight, but both species were in poor condition, and the occasional individuals evidently belonged to a brood already well over. Here and there, too, common whites and the usual products, of areas of civilisation were observed, and, in one spot, several fine fat, black, red-spotted, lazy larvæ of *Hyles euphorbiae* were noticed stretched in delightful indolence on the little *Euphorbia* plants, in the hot sun, whilst several smaller green ones were quickly observed when attention was once drawn to them, but one had to pass the village of Madrano before one really scored. Then the wild slopes commenced and upon them butterflies began to be frequent. These slopes are thinly covered with small bushes, and, at this time, were beautiful with wild-flowers, but, steep as they are, one noticed a few days later that the natives were mowing them wherever at all practicable. The slopes extend down to the main road, now several hundred feet below, that runs through the valley, and even beyond down to the river. Although steep, they are fairly easy for an entomologist to work and the little trickling streams form centres of attraction to the butterflies, where they cross the footpath. *Par-nassius apollo* was in large numbers, and in fine condition, tumbling and falling down 1000 feet of the steep slopes with evident enjoyment; some strongly-coloured *Papilio machaon* also swung lazily on the flowers, but their condition left much to be desired, whilst, of the larger fritillaries, *Argynnis aglaia* was more abundant than *A. niobe*. These species were in magnificent condition and both are really beautiful insects when swinging, wing-expanded, with the hot sun shining directly on them. Here and there a newly-emerged *Pyrameis cardui* was noticed, whilst a magnificent lot of fresh *Melanargia galatea* flew everywhere; both sexes were almost equally abundant, and there must have been thousands of them. A newly-emerged batch of *Pararge maera* was also noticed, the ♀s rather dark and large, whilst a few ♂s of *Epinephele lycaon* were also observed, no ♀s yet being on view. Sitting on the pathway, fanning their wings, were some fine *Issoria lathonia*, particularly difficult, however, to capture in the sun, whilst the only *Erebia* on view was *goante*, and this apparently only just coming out. It were easy to say that one was disappointed with the "burnets," for, with the exception of a few *Anthrocera lonicerae*, and one or two *A. carniolica*, there was nothing but *A. purpuralis*, but these, good bad and indifferent, were in sufficient numbers to have supplied most of the cabinets in Europe with specimens. Now and then *Leptidia sinapis*, flew among the bushes, and were netted and examined most religiously, for, late as it was, each was seen to be of the early brood, although now in poor condition. This gave some clue to the before-stated fact that the season was late in 1907 in the higher Alps. I am afraid much time was taken from

MAY 15TH, 1908.

collecting for observation purposes, for one finds that one has largely to make one's own observations to fill out the natural history of the butterflies, whose life-histories we are attempting to do with some degree of fulness, and, when we came across butterflies common to Britain and the ground we were on, notes had to be taken of the actual personal peculiarities of the species. This does not add to the "bag," and it is wonderful how long a small observation takes, especially if set down in writing on the spot. *Leptidia sinapis* was one of these that came in for its share, and so also did *Brenthis euphrosyne* of which a few worn ones were seen ovipositing on the edge of the pines that, in one place, form a wedge-like extension down the mountain-side. These observations have been, or will be, recorded elsewhere. Then at the little tricklings crossing the path, on the thyme-clad slopes, the ways of *Lycaena arion*, *Agriades corydon*, *Aricia astrarche* and *Plebeius aegon* had to be carefully noted, and interesting species, indeed, they are. With them, at the water, were some fine large *Hesperia alvens*, *Plebeius argus* and *Adopaea lincola*, the latter in fine condition, whilst its ally, *A. thaumas*, a much larger insect here, was quite worn and beyond hope. Here too, I was much interested with the little *Ennychia octomaculata*, its fine glossy black wings with their white spots being kept well up from the damp ground, whilst the insects drank and swilled with the best of their comrades. Two very large ♂ *Polyommatus hylas* were taken, one very fine, and one worn, suggesting that this insect is on the wing for some time, in the same brood. Here, on the higher slopes, too, *Melampias melampus* commenced to appear, with the blues, many ♂s at almost every rill, whilst *Erebia goante* was more abundant, but no ♀s. The specimens of *Gnophos obfuscata* disturbed were remarkably dark, whilst, among others, one very finely marked **IVI** specimen of *Setina aurita* was taken, the prevalent form, however, being distinctly spotted and not streaked. On the *Centaurea* and scabious flowers, *Adscita geryon* was not uncommon, and in good condition, charming little metallic green items when resting fully in the middle of a scabious head. The ♂s of *Heodes virgaureae* were in beautiful condition, not a ♀ observed, so that the species was evidently only just emerging, and usually with traces at least of the black discoidal spot on the forewings, generally said to be characteristic of var. *miegii*; a single ♀ *Chrysophanus hippothoe* in one damp spot, where a streamlet had spread out on a little flat on the slopes, with a few worn ♂s, showed that the species was already over. Near here, too, *Brenthis amathusia* was not uncommon but evidently passé, whilst two ♂ *Melitaea didyma* showed that the species was only just coming out; a single ♂ *Gonepteryx rhamni*, evidently newly-emerged, was disturbed from a flower, and gently letting itself down the slopes, smiled sweetly at a hasty attempt to net it, that must have missed, smartly as we struck, by yards. A single worn *Melitaea phoebe* also told its own tale. One species, however, interested us, and of this we brought away a nice series. This was what, for want of better knowledge, we call the mountain-form of *Melitaea athalia*; my friends may call it what they like, I call it what I can. Here, where the pines come down the slopes quite low, a little trickle wells over the path and makes a nice big wet patch; and to this we found the *Melitæas* attracted, not in swarms, but a few at the time, always three or

four to be found there after a few minutes, whilst plenty flew in and out among the stunted bushes near, or sunned on the flowers, so I made an attempt to get a few, and very puzzling they are. One very nice *Melitaea dictynna* was taken at the same spot. The purely British collector could have walked up a nice lot of *Acidalia ornata*, and those who liked "bloodveins" would have found a good many of one beautiful species, whose name for the moment has escaped me. So one wandered on to the village of Brugnasco and to the pine-forest beyond, where lunch was eaten in the shade on the bilberry-covered ground—and, when lunch and the bilberries were finished, an afternoon crawl back over the same ground was very delightful. I'm afraid I'm a lazy sort of entomologist and cover too few miles for half the fraternity, but there it is; this is what I saw on the slopes at Brugnasco on one of the loveliest days that ever existed, and I feel satisfied.

Notes on Scotch and other Proctotrypidæ.

By the late ARTHUR J. CHITTY, M.A., F.E.S.

(Edited by Claude Morley, F.E.S.)

The *Annals of Scottish Natural History* has recently published two parts of a list of the Scottish *Oxyura* or *Proctotrypidæ* present in the collection of Mr. Cameron, by whom the articles are written. These lists are very welcome. Mr. Cameron's collection has been in the hands of Dr. Kieffer for the purposes of the doctor's work on the European species, published in André's "*Species des Hyménoptères d'Europe et d'Algérie*," so a large number of Mr. Cameron's specimens apparently form the types of Kieffer's insects, some of which have only been taken by Mr. Cameron.

The lists are somewhat startling. Dr. Kieffer's method of dealing with the older names has been summary. The descriptions of a large number of those of Walker and Haliday (the types of which were sunk in the Bristol Channel) have been pronounced by him as insufficient. In their place he has raised up in his great work a host of new species, all properly worked out and tabulated. Dr. Kieffer has hardly been more considerate with the names assigned to the British species by the Rev. T. A. Marshall. A large number of them are now pronounced not to apply to the British insects at all, and specimens so named are often relegated to two or three new species of Kieffer. If Mr. Cameron's collection contains so many new species forming quite a large proportion of those recognised by Dr. Kieffer, there must be many more new species awaiting discovery, and the total number of these insects must be very large. More collectors of the group are accordingly particularly necessary, and now that lists and tables are forthcoming, there should be less difficulty in working out the specimens, and deciding what specimens belong to new species, a task hitherto impossible in this country without great risk of error.

It is a pity that Mr. Cameron's valuable lists do not give more information, a reference to the place where the description could be found is almost indispensable if the lists are to be used for practical purposes; and dates and numbers of specimens caught would be useful. Though these insects at times appear in great numbers, as a rule only one or two specimens of the same species are taken by

collectors, and it may be that many of the species are represented by unique specimens. The publication of these lists should encourage others to supplement them, and it is hoped that they will induce the publication of a new British list, as the names in Marshall's *Catalogue* are now entirely out of date and misleading.

A few remarks may be made on the first list published; most of those on the second must remain till the publication of Kieffer's work dealing with the insects. At the date of publication the great majority of Kieffer's species in the list were MS. names, but Kieffer's work, with the descriptions, is gradually appearing, and no harm will have been done by the somewhat premature appearance of the second list. The family as a whole is termed by Mr. Cameron, the *Oxyura*, a name which has of late fallen somewhat into disuse, the group having been known as the *Proctotrypidæ*. The justification for the restoration of this term arises from the discordance of the elements composing the family; parts are closely allied to the Aculeates, while the other parts are undoubtedly true *Parasitica* (*Tarabrantia*), with affinities not to one family only, but to several; thus the *Mymaridae* are so closely allied to the *Chalcididae* that they may either be treated as Chalcids as is done by Ashmead, or as Proctotrypids as the majority of authors regard them. Some of the *Ceraphronidae* run very close to some of the *Cynipidae*, the family apparently nearly related to the *Proctotrypidæ*: in having the terebra emerging from the tail the group approaches the *Chrysididae*, with its tubular ovipositor. The families of the *Oxyura*, in which the terebra has been regarded as a true sting, are the *Bethylinae*, *Dryininae* and *Emboleminae*: these are distinguished from all the other families by having the hindwings with a lobe at the base. Mr. Cameron has, however, divided the *Oxyura* into two main groups; the *Bethylidae* corresponding with the *Bethylinae*, and the *Proctotrypidæ* including all the other families. The justification is that the *Bethylinae* (or at any rate some of them) alone have the habits of the Aculeates, which they resemble by provisioning their nests with stung larvæ, not, however, making a cell or assigning any particular food to any larva, but leaving the larvæ together to feed on the stored food, *cf.* Haliday, André and Ashmead.* The habit can, however, hardly obtain throughout the group, *e.g.*, in *Cephalonomia*, which is bred from fungus, and is probably parasitic on *Cis* (*cf.* *Trans. Ent. Soc. Lond.*, 1907, p. 24). The *Dryininae* though agreeing with the *Bethylinae* as to the wings, are parasitic like ichneumons, the truth being that here, as elsewhere, Nature refuses to submit to a dichotomous division, and we think that no advantage is gained by separating the *Dryininae* from the *Bethylinae*, and treating the *Bethylinae* as a separate sub-group, though, like Mr. Cameron, we prefer to treat the *Bethylidae* or *Bethylinae* as the first family of the *Oxyura*.

As to the list, there seem one or two trivial errors: *Bethylus fuscicornis* should apparently be assigned to Jurine, not Walker, though Walker rightly named the insect. This common species has, until recently, been known as *Perisemus triareolatus*, but the view of

* In October, 1902, I received for determination a specimen of *Bethylus fuscicornis*, Jur. (= *Perisemus triareolatus*, Först.), from Mr. Richardson of Weymouth; this was "bred from *Gelechia brizella* on thrift, Littlehampton, 20th June, 1889," and it is the only known occurrence of this species attacking a lepidopterous larva in the form of an entomophagous parasite.—CLAUDE MORLEY.

the nomenclature put forth by Kieffer seems sound, and the insect is so common that it cannot have escaped the earliest writers on the group. Mr. Cameron's list omits, whether purposely or not we do not know, *Rhabdapyris fasciatus*, Kieff., recorded in André, vol. x., p. 377, as taken by Mr. Cameron in Scotland. It is a large insect of 6mm., entirely new to the British list, of which we know nothing but the description, etc., in André. Can there be some mistake about the record? It is strange that Scotland is so badly represented in this subfamily, but the other British genera (*Cephalonomia* 2 spp., *Pseudisobrachium* 3 spp., *Epyris* 2 spp., and *Goniozus* 1 sp.) all appear to contain exclusively southern insects: *Pristoura* in the Oxford Museum ("Netley, Hope") and *Saleroderma* (of André) are also doubtfully English. There are also two other English *Bethyli*, viz., *hyalinatus*, Marshall, and *cephalotes*, Förster, besides those recorded by Mr. Cameron. Turning to the *Dryininae*, the proportion of insects found in Scotland is very large, and two *Gonatopi* have since been recorded in addition.* With reference to the genus *Antaeon*, we may point out that *A. nigricornis*, Kieff., was renamed by him *A. obscuricornis*: *A. nigricornis* being preoccupied by Perkins, and also *A. parvulus* was renamed *A. parvus* (cf. Errata to vol. x.) and these should be corrected in Mr. Cameron's list. There no. 40, *azorus*, Walk., is apparently *alorus*, Walk.; this is one of the insects spoken of by Kieffer as insufficiently described, and it is desirable that Mr. Cameron should give particulars enabling the insect to be placed in Kieffer's tables, otherwise it cannot again be identified, and will become a useless name.

Passing to the second article, apparently the new *Scelioninae* are not yet entitled to the names given them, as they have not, so far as we can find out, been described; this, no doubt, will soon be remedied. The *Ceraphroninae* follow. Mr. Cameron has apparently intended to divide them into *Megaspilini* and *Ceraphronini*, following Ashmead, but, if so, he has omitted the word *Ceraphronini*: anyhow, there is nothing to correspond with the word *Megaspilini*, and the division, though convenient, is not sound, as the different sexes of *Lagynodes* fall into different divisions (cf. Kieffer, vol. xi.). As regards the genera of the *Ceraphroninae*, *Megaspilus*, West., is now assigned by Kieffer to what was *Habropelta*, Thoms., of Marshall's *Catalogue*, i.e., the insects with a bifid spine on the metathorax, and *Conostigmus* takes the place of *Megaspilus*: the genus was, however, founded by Dahlbom, not Kieffer, and this should be corrected and so should the inclusion of *C. punctulatus*, Cam., and *C. mullensis*, Cam., in *Megaspilus*, West., as they are without the bifid spine. The species of *Conostigmus* (the old *Megaspilus*) have been little understood by Marshall, judging from Kieffer's comments on Marshall's collection. If, however, Marshall's *Catalogue* were really compiled on the collection lost, and this one forms the second collection, in which insects were wrongly named in the absence of the types or first-named species, the errors are readily intelligible; being microscopic, the insects require frequent comparison with authentic examples, and the loss of the former collection must

* Taken by W. Evans, and recorded by Chitty in *Ent. Rec.*, 1907, p. 81.

† In Cameron's first list, we notice that *Antaeon divisus*, K., is entered three times, and *A. indivisus*, K., twice (C.M.).

have made a break in the continuity of Marshall's labours, the importance of which cannot be overestimated. In conclusion, we hope Mr. Cameron will continue his lists, and propose that he give more information with those of the later groups.

***Eupithecia tamarisciata* as a British insect.**

By J. W. TUTT, F.E.S.

In the *Ent. Rec.*, xviii., pp. 157-8, I wrote a note on a puzzling group of Eupitheciids, explaining my unbounded ignorance; the latter may, however, be assumed as real knowledge in comparison with what most entomologists seem to know. This was followed up by a note on the state of ignorance on this subject in Germany by Mr. Dadd (*op. cit.*, pp. 259-260), and a further critique on this communication by myself (p. 260). In *The Entom.*, xl., pp. 206 *et seq.* Mr. Prout took on the manipulation of the search-light, and has continued operating until during the present month he has put out the lamp (*Ent.*, xli., pp. 52-53) and left those who have followed up the matter in an obscurity resembling that of one of the plagues with which the poor Egyptians were once worried. Out of it all comes the fact that we are exactly where we were and that our ignorance on this matter is profound.

It takes little time for even straightforward facts to be so upset that one hardly recognises them. Such a vast time ago as June 15th, 1906, I wrote:—

“It is a remarkable coincidence that, just after I had prepared this note for publication, I met, at the Natural History Museum, South Kensington, Mr. Holmes, of Sevenoaks, who had two specimens of an *Eupithecia* bred, amongst several others, by his wife, from larvae taken in Cornwall last year on tamarisk, and which one had little difficulty in referring to *E. tamarisciata*, a form, or species, not hitherto recorded from Britain. It behoves British entomologists, therefore, to bestir themselves, and prove or disprove the specific identity of these insects. In our opinion we have here three British species, whilst Staudinger's *Catalog* suggests that they are but one, as shown by the synonymy quoted.”

Mr. Prout now says that “Mr. Holmes” bred them, and that this note of mine was “premature.”

Again on August 15th, 1906, I wrote:—

“Mr. Dadd thinks that the onus rests on British entomologists to disentangle the muddle made in Germany. British entomologists do not unite *fraxinata* and *tamarisciata* as vars. of *imnotata*, they treat them as distinct species. We can prove, as far as their biology in Britain permits, their distinctness, it is for the German entomologists to prove their biologic unity. If there is not more ‘evidence’ than Herr Herz offers, and the remarkable statement of Staudinger that a species that emerges in June is the summer brood of a species that hibernates from September to May, and is only just (or not quite) over when the so-called summer brood appears, I am afraid we cannot get much further by means of the help of our continental colleagues. Our own evidence is not too illuminating or too abundant, but it shines as a sun compared with the haze that Mr. Dadd quotes from our friend Herr Herz.”

Now Mr. Prout has discussed the question and some of the clearness of the first part of his argument has been unfortunately clouded by the uncertainties he notices in the second, and one asks “Where are we now that we were not before? Mr. Prout's quotation (*Ent.*, xli., p. 52) from poor Robson is, if one may be permitted to say so, characteristic of

the writer. He lived in an entomological muddle and worry, as hundreds of his letters to us show, indeed, the notes are strongly suggestive of "Box and Cox," and I feel satisfied that Mr. J. Gardner would rather confirm on the field his previous recollections than wish that any really important issue should, even in part, be settled on the scanty information at present available.

But all this is negative and carries us nowhere. My object in writing is to protest against Mr. Prout's concluding paragraph giving his opinion of my share in the matter. He writes (*Ent.*, xli., p. 53):

As to the *E. tamarisciata* (?) bred by Mr. E. M. Holmes, F.L.S., from North Cornwall (*Ent. Rec.*, xviii., p. 158), Mr. Holmes tells me he was unaware that Mr. Tutt intended to publish a reference to it, and it was perhaps a little premature, as Mr. Tutt had not seen the larvæ, and evidently only determined the species by the foodplant. Mr. Holmes has very kindly submitted his material to my inspection, but as he will no doubt write upon it when further elucidation has been obtainable, I shall not forestall him further than to say that I quite agree with him that his larvæ did not tally with the only definitely known form of *tamarisciata*, but much rather with *fraxinata*, and that for the present I would not venture to locate the imagines; of course, they belong to this group (or species, if Staudinger is right).

I would ask why I should fall under the strictures of my friend, Mr. Prout. First and foremost the facts are as follows:—

(1.) Mr. Holmes is a well-known botanist; his wife collects lepidoptera. Mr. Holmes brought two imagines and a drawing of the larva of an *Eupithecia* to the Natural History Museum, to compare with the material in the National Collection, and submitted the material to Sir G. Hampson.

(2.) As I happened to be at work at the Museum, Sir George Hampson showed the examples and referred the matter to me, and I immediately located them to the group to which they belonged. I compared them with the material in the collection, and it was clear they were *tamarisciata*.

(3.) Mr. Holmes informed me that his wife bred them, not himself, that he was not a lepidopterist, that some of the pupæ were still unemerged, etc. He informed me that they had been reared from tamarisk, and this confirmed my reference.

(4.) I then turned up Staudinger's *Catalog*, looked through the references, and noted what Freyer, Guenée, and others said about it. I also looked up the figures and references to other tamarisk-feeding pugs to see what was known. I spent, perhaps, almost an hour on the subject and when the proof of a short paper on *Eupithecia fraxinata* and *E. innotata* came back to me from the printer a few days later, I added the note quoted (*antea*, p. 102). At the present moment the two following facts stand out clearly:—

(1.) Specimens bred from larvæ found on tamarisk by Mr. Holmes.

(2.) Agree exactly with the long series of specimens labelled *tamarisciata* in the National collection.

Mr. Prout agrees that they belong to the group (or species) *fraxinata* + *innotata* + *tamarisciata*, yet would "not venture to locate the imagines." He also states that Mr. Holmes' larvæ "did not tally with the only definitely-known form of *tamarisciata*" (no doubt the picture I turned up for Mr. Holmes when I went into the matter) "but much rather with *fraxinata*," which, in species with variable larvæ

like those of this group, is not a very promising statement. Is there only "one form" of *tamarisciata* larva?

In conclusion I would ask what Mr. Prout wants to prove? He says that Mr. Holmes' drawing of the larva is more like the drawings of some larvæ referred to *fraxinata* than to the only known drawing referred to *tamarisciata*. If so, what does it prove? Again, why was my note, published June 15th, 1906, premature? I had done then all that it is possible for anyone to do now—heard all Mr. Holmes had to say while the matter was quite fresh, saw specimens, picture of larva, compared both with all the British Museum material, and all the available literature (with figures) of imagines and larvæ at South Kensington. And why say on the strength of this that "Mr. Tutt had not seen the larvæ, and evidently only determined the species by the foodplant"? Has Mr. Prout seen "the larvæ," particularly the larvæ of the imagines from which I recognised the species at the British Museum? It is obvious neither of us could. Has he seen a drawing only, made from one of Mrs. Holmes' captures? If so, was this a colour-drawing only, or is it a detailed one with all the structural details worked out by a competent entomological biologist? and does turning up all the literature, and comparing the specimens with those in the British Museum collection, show that I "evidently only determined the species on the foodplant"? I still maintain that the specimens I saw at South Kensington were those of *E. tamarisciata*, and no entomologist in Europe is likely to convince me of the error of my judgment, without first proving that the *E. tamarisciata* of the British Museum collection bred from tamarisk are not of this species (or form). I have handed over my Geometrid soul's salvation to Mr. Prout for a long time, I owe to him kindnesses and advice on hundreds of critical points whilst writing my *Natural History of the British Lepidoptera*, but I do know better than he on what grounds I determined the Cornish examples as *tamarisciata*, and there is no reason why any lepidopterist, for whose opinion I care, should think that I did this prematurely and without due consideration.

Some Tineids of Wimbledon Common.

By ALFRED SICH, F.E.S.

In sending this small contribution towards a list of the Lepidoptera of Wimbledon, I may state that had I worked the Common with a view of making a list of its Tineid inhabitants, my record would have included a far greater number of species. The following species are those of which I find mention made for one reason or another in my notes.

Argyresthia nitidella, F., var. *ossea*, Hw.—I took a nice specimen of this on August 15th, 1905. Two *A. retinella*, Z., taken June 30th, 1906. In 1905, *A. goedartella*, L., and its golden aberration were very abundant. *Cedestis farinatella* occurred on pine, August 15th, 1905. Imagines of *Cerostoma nemorella*, L., and *C. xylostella*, L., bred from larvæ from the Common, were exhibited by Mr. Penn-Gaskell at the South London Entomological and Natural History Society, June 28th, 1906. *Epithectis mouffetella*, Schiff., one imago taken off a leaf of honeysuckle, 1905. *Batrachedra praeangusta*, Hw., several specimens

noticed in 1905, on trunks of *Populus alba*. *Coleophora juncicolella*, Stt., in the damper spots where the heath grows in scattered patches. *C. lutipennella*, Z., abundant on the oaks. *C. limosipennella*, Dup., a few larvæ taken off birch. *C. solitariella*, Z., some colonies noticed in lanes near the Common. *C. viminetella*, Z., the larvæ feed here on *Salix repens*, close to the ground, as well as on ordinary willow. *C. bicolorella*, Stt., larvæ common on birches. *C. fuscadinella*, Z., abundant on birches. *C. albicosta*, Hw., on furze. *C. ibipennella*, Z., also on birch. This is Stainton's *ibipennella*, but is it really that of Zeller? It may be *betulella*, Hein. *C. hemerobiella*, Sc., on hawthorn and *Pyrus aucuparia*. *C. murinipennella*, Dup., and *C. caespititiella*, Z., I have also noticed. *Elachista rufocinerea*, Hw., is sometimes abundant. It was in plenty, May 7th, 1906. *Lithocolletis ulnifoliella*, Hb., occurs on birch. *L. sorbi*, Frey, one specimen from *Pyrus aucuparia*, May 7th, 1906. This specimen was submitted to Mr. E. R. Banks, who kindly confirmed its identity. *L. emberizaepennella*, Bouché, occurs on honeysuckle. *L. comparella*, Z., the mines are not rare beneath the leaves of *Populus alba*. *Opostega salaciella*, Tr., one specimen on the herbage, August 2nd, 1906. *Tinea cloacella*, Hw., two very dark specimens on a birch-trunk, August 2nd, 1906. *Adela viridella*, Sc., abundant flying over the hawthorn bushes. *Eriocrania unimaculella*, Zett. and *E. semipurpurella*, Stph., were both common on birch, April 10th, 1906. These thirty odd species of micros are as a drop in the ocean to the number which might be obtained, especially if the Tortricids be also taken into account, many species of which I have noticed on the Common.

Melitæa phoebe var. occitanica, Stdgr.

By J. W. TUTT, F.E.S.

A note recording (*antè* p. 55) the capture of *M. phoebe* var. *occitanica*, in the Val d'Anniviers, leads me to suggest that the var. *occitanica* is surely a purely Spanish form. The original description (Staudinger, *Catalog*, 2nd ed., p. 18) is, of course, vague—"forma magis variegata. It.," the "It." (Italia), being evidently a misprint for "Ib." (Iberia), since, in his *Catalog*, 3rd ed., p. 29, Staudinger repeats "forma magis variegata," but adds "Iberia" in full, and does not mention "Italy." It is true that my friend, Mr. Wheeler, records (*Butts. of Switz.*, p. 84) var. *occitanica* from various parts of the Rhone Valley, and its southern lateral branches, and further notes that, "on the south side of the Simplon the specimens are much finer than from Granada," but we are not concerned with this; what is of importance is that the large single-brood examples from moderate elevations in the Alps of Central Europe, are apparently not of the Iberian type, of which we have a fine and extensive series taken at different times, and in various parts of Spain, by Dr. Chapman, and the alpine examples, of which we have also a very long and varied series, certainly should not, we think, be referred to this name. It is hard to believe that this Central European var. *alpina* has not been previously described under some name or other, and we are too busily engaged with other entomological puzzles just now to work out the variation of the species in detail, but the forms of this, and some of the allied, species, do want careful revision, with full reference to the original descriptions, aided by

comparison with specimens from the localities, whence those from which the original descriptions were made came. Staudinger seems rarely to have referred to the original description to determine the typical forms of the various species described by the older European authors, and it would be interesting to know which is the typical form described by Knoch. When dealing with the Central Asiatic forms, Staudinger possibly rarely goes wrong, as many were described by himself, or the specimens described by other collectors passed through his hands. One doubts, too, whether the real Ural race, named *aetherea* by Eversmann, also recorded from Switzerland, occurs there. We appear to be wrongly using certain racial names, which is inadvisable, and will cause trouble to later workers. The variation of the group really wants carefully, not superficially, working out, and those collecting butterflies in Central Europe should be careful how they apply, from some catalogue or other, the names given to extreme eastern and western forms, to those coming from the Swiss Alps or other parts of Central Europe. The application of such names is almost sure to be erroneous.

Some new British Myrmecophilous Proctotrupidae.

By H. ST. J. K. DONISTHORPE, F.Z.S., F.E.S.

Polynema albitarse, Kieffer.—I took this little species in a nest of *Formica rufa*, at Rannoch, July 18th, 1907.

Ceraphron formicarum, Kieffer.—Dr. Kieffer tells me this is the name of the species recorded by me last year with *F. rufa* at Corbridge.

Ceraphron sp.?—Taken in a nest of *Myrmica ruginodis*, at Buddon Wood, Leicestershire, August 3rd, 1907.

Conostigmus sp.?—Taken in a nest of *Formica rufa*, at Weybridge, July 8th, 1907.

Platygaster sp.?—Taken in a nest of *Formica rufa*, at Rannoch, July 19th, 1907.

Lagynodes pallidus, Boh.—Mr. H. Willoughby Ellis has taken this species in a nest of *Formica rufa*, at Knowle, July 19th, 1907. It will be remembered that I have taken it with *Lasius fuliginosus*, at Oxshott.

✓ *Exallonyx fumipennis*, Kief., var. *donisthorpei*, Kief., n. var.—Two specimens were taken in a nest of *Myrmica scabrinodis*, at Wallasey, in October, by Mr. Arnold.

✓ *Exallonyx wasmanni*, Kief., var. *sociabilis*, Kief., n. var.—I took this little species in a nest of *Lasius fuliginosus*, at Wellington College, September 27th, 1907.

I have to thank Dr. Kieffer for kindly naming most of the above.

The Lepidoptera of Ticino—The St. Gothard Pass.

By J. W. TUTT, F.E.S.

In fine weather go up the mountains, my friend had said, so I cast about, and the next morning, August 3rd, being gloriously sunny, I started in the opposite direction, this time across the fields to the foot of the St. Gothard Pass. Crossing the fields in as straight a line as possible, I wondered what the gods would send, but the first mile produced nothing better than a few Pyralids on the cats' mint flowers, together with an occasional *Aglais urticae* and *Pararge maera*, but once on the main

road, and then among the clearings of the woods through which the zigzags passed, many species came into play. *Parnassius apollo* was in great abundance, and the specimens looked exceptionally large, but I do not know now that they are set that the two or three examples chosen are at all special, but they looked well, and were in prime condition, whilst, during the first hour's hunt, one struck an abundance of what I have before called mountain *Melitaea athalia*, *Erebia ligea* going over, *Agriades corydon*, *Aricia astrarche*, large newly-emerged *Anthocera lonicerae* and *A. purpuralis* in great numbers on the flowers by the roadside. They sat with quivering wings in the hot sun, or restlessly moved from one flower to another; here, too, *Heodes virgaureae* ♂s were abundant, but not a single ♀, whilst a very worn ♀ *Pararge hiera* and *Brenthis euphrosyne* were bagged, but, besides those already noted and *Erebia goante*, towards the end of the climb through the wood, nothing seemed very abundant, although many species occasionally turned up. An open glade with a patch of what was probably bugle was being passed, when suddenly, in characteristic fashion, a specimen of *Hemaris tityus*, in finest condition, hovered over the flowers, and in a moment was in the net and boxed, although standing back and waiting did not produce another. *Hesperia alveus* and *Adopaea flara* were the only skippers noted, the former large and in good condition, the latter worn. A single *Melitaea dictynna* fell to the net; I suppose I am always a little late for this species; anyway, I never seem to get a good series, and am always thankful when good examples come my way. Here, too, a specimen or two of *Lycaena arion* var. *obscura* were pulled up suddenly for examination as they careered somewhat wildly up the slope, whilst there were plenty of the two common fritillaries, *Argynnis niobe* and *A. aglaia*. *Issoria lathonia* was not common, and *Melampias melampus* was in good condition. At last one left the woods behind, and the alpine pastures stretched above. *Colias phicomone* soon came in sight, and before one had climbed far, *Erebia euryale*, *E. tyndarus*, and other species began to appear, whilst the only "blue" on the exposed slopes besides *Aricia astrarche* appeared to be *Cyaniris semiargus*. Plenty of *Argynnis aglaia* dashed up and down the slopes, and a large *Papilio machaon* also flew rapidly some distance below where we were standing, and freshly-emerged *Aglais urticae* were on the wing. Large clumps of violet-plants were growing among the rocks, and here a few worn ♀ *Brenthis euphrosyne* were yet egg-laying. *Erebia tyndarus* and *E. euryale* became now quite abundant, and, by the time we struck the path again above, the lowland species, so to speak, were left entirely behind; a small damp and marshy spot was investigated, but nothing of importance appeared except a fair number of *Brenthis pales*, a single small ♂ *Chrysophanus hippothoe* apparently only recently emerged, a few *Hesperia alveus*, one large *Polyommatus hylas*, and still a few fine *Cyaniris semiargus*. The rocks by the roadside, as we now forged ahead, showed plenty of *Gnophos obfuscata* and *Larentia caesiata*, whilst specimens of *Melanippe montanata*, *Larentia flavicinctata*, *Acidalia mutata*, and *Eubolia bipunctata* were also captured. A runnel by the roadside produced *Coenonympha darwiniana*, whilst *Erebia mnestra* ♂s were not at all uncommon, *E. tyndarus* and *E. melampus*, together with *Parnassius apollo* and *Argynnis aglaia*, still occurred freely. Then we reached the zigzags that form the final grind to the

summit of the Pass, and, by taking the short cuts, one expected to get at least representatives of most of the alpine species on the slopes. *Erebia gorge* and *Anthrocera eulans* soon appeared, and a little later *Erebia lappona*, but they were few in number, and the butterflies quite beyond cabinet condition. *Colias phicomone* occasionally flew across the slopes, and, wherever a marshy flat appeared, there *Brenthis pales* flew freely, but, with the exception of swarms of the little black Pyralid, *Titanio phrygialis*, there appeared to be nothing, and at last we reached the first lakes that meet us in this direction when ascending the path. Large patches of snow lay by the roadside, and the hollows were still here and there full of it, and, as the sun shone brilliantly on the snow, lakes, and rocks, whilst the running water sparkled like diamonds wherever the streamlets fell down the mountains, the immediate surroundings looked exceedingly beautiful. We walked on to the inn at the top of the Pass, and then beyond, round and among the lakes for a mile or so, over the snow that still here and there filled up the hollows in the road, but there appeared to be no butterflies. On the mountains above, the heights are covered with military forts, and the rocks are bare and bleak; the mountains shut in the summit of the Pass, and there is no mighty vista extending beyond in any direction. One is so high that the summits of the mountains look mere hills, which one could climb in a comparatively short time, and one wonders yet what entomological treasures the hollows above these beautiful alpine lakes hold. Some day they will perhaps give up their treasures, but it was not to us, and we have returned home almost entomologically empty. But the day remains—a day of perfect loveliness, amid alpine scenery of almost barren grandeur, softened by the forests of the lower slopes and the lovely blue of the summit lakes—a day for the memory, to be stored with others, so like, yet so different.

Notes on the Life-Histories of two supposed Ants'-nest Beetles (with plate).

By H. St. J. K. DONISTHORPE, F.Z.S., F.E.S.

Labidostomis tridentata, L., has been recorded from ants' nests (see Fowler, *Col. Brit. Isles*, vol. iv., p. 285, "sometimes found about ants' nests," etc.), and, as its near ally, *Clythra quadripunctata*, passes its early life in the nests of *Formica rufa*, it might also be supposed to have some connection with ants. I reared larvæ for several years running, although I was unable to breed the beetle right from the egg, the larvæ always dying in the winter. I found, however, that the larvæ would never live in, or enter, my observation-nests, and I could never find a trace of either larvæ, pupæ or perfect insects in ants' nests at Pamber Forest, where the beetle was abundant. I, therefore, think it has nothing to do with ants. The perfect insects fly about young birch-trees and eat the young leaves, and are most abundant about the end of May. I kept numbers in captivity, and obtained many eggs. On May 31st, 1903, I observed the process of oviposition in nature. These eggs hatched about July 7th. The ♀ lays bunches of 5 to 25 eggs; she does not drop them, as the ♀ of *Clythra* does, but fastens them to a birch-leaf; all the eggs are fastened together, and to the leaf, with long thin threads of excrement, and the eggs themselves are covered with excrement, which the ♀ rolls round them

with her back feet. The covered egg is a much smoother object than that of *Clythra*. When hatched, the little larva remains inside the egg-case, which it detaches from the rest of the bunch. It looks as if it were in a tub turned upside down, as it walks about with the case pointing upwards. The newly-hatched larva is somewhat like a young *Clythra* larva, the abdominal segments are bent forward, the legs are long, and the head is broad. The body is of a dirty yellowish-white, and the head dark brown. The two-jointed antennæ are short, and the tarsi are represented by a claw. The head is furnished with a few long hairs. I found that they feed on algæ on bark of trees. I here figure the covered eggs and larvæ for the first time (pl. ix., figs. 1-3).

Prionocyphon serricornis, Müll., has also been recorded from ants' nests, Fowler writes (*Col. Brit. Isles*, vol. iv., p. 124), " . . . it has also been found in nests of *Formica rufa*." Some years ago Dr. Sharp told me that the larva* of *Prionocyphon* was unknown, and that he thought that, as the larvæ of the *Cyphonidae* were aquatic, it would be found in holes, in trees full of water, as the beetle is a dweller in woods and forests. After I had heard this I was always trying to find the larva, and, on July 8th, 1905, I found a number of *Cyphon*-like larvæ with long antennæ, in a hole full of water in a felled oak in the New Forest, which I hoped might prove to be *Prionocyphon*, but, unfortunately, they all died. However, on July 17th, 1906, I visited the same tree, and obtained plenty more. These I fixed up in a bowl with some of the water, dead leaves and wood-refuse from the hole in the tree, and put some of the oak-bark, covered with moss, on the top. I bred the first perfect insect on July 27th. On the 28th I noticed a larva creep under the moss on the bark, and it changed to a pupa on the 29th. This I had figured and then returned to its place, and it hatched on August 1st. As will be seen a very short time is passed in the pupal state, a larva which pupated on May 19th, 1907, hatched on May 24th. In 1906, I bred 7 specimens, no more hatched after August 1st, in 1906, but eggs must have been laid, as, on November 1st, I found many very small young larvæ in the bowl. On December 18th I isolated a very young, and a big larva, and put them in little glasses with rain-water in; they soon died, but two more put in the same glasses with water from the bowl, and bits of decayed leaves, seemed quite comfortable. The larger one pupated on May 22nd, 1907, when I put in a bit of bark. In 1907, I bred 16 perfect insects, and they were all considerably larger than the 1906 specimens. On May 19th, I put in some new bark, and found one pupa and five larvæ pupating on the old bark. The perfect insect is a most active creature, and flies very readily; on one occasion, when I had taken the muslin off the top of the bowl to show the contents to my friend, Professor T. H. Beare, a beetle flew out of the bowl to the ceiling of my room where it circled round and round with great rapidity, looking more like a fly than a beetle. The shortness of the life of the perfect insect and its obscure habits account for its scarcity in nature. I have only once taken it at large, *viz.*, when I took a specimen off my friend Mr. Bouskell's hat in the train, after we had spent the day at Buddon Wood; very few

* Mr. Gahan recently called my attention to the fact that the larva and pupa of *Prionocyphon* had been described by T. Beling (*Verhandlungen der k. k. Zoologisch-Botanisch. Gesellschaft*, Band xxxii., p. 436, Wien, 1883).

coleopterists have taken it, or more than a single specimen at a time. As I have pointed out, the larva and pupa have been described, but I here figure them for the first time (pl. ix., figs. 4-5). This species has nothing to do with ants, its occurrence with them having been, of course, only accidental.

The drawings are by Mr. Hereward Dollman, Mr. Horace Knight and Mons. Engel Terzi.

EXPLANATION OF PLATE IX.

DETAILS OF EARLY STAGES OF *LABIDOSTOMIS TRIDENTATA*, L., AND *PRIONOCYPHON SERRICORNIS*, MÜLL.

Fig. 1.—Bunch of eggs of *Labidostomis tridentata*, L.

Fig. 2.—Young larva of the same.

Fig. 3.—Larva walking with egg-case.

Fig. 4.—Full-grown larva of *Prionocyphon serricornis*, Müll.

Fig. 5.—Pupa of the same.

Synopsis of the Orthoptera of Western Europe.

By MALCOLM BURR, B.A., F.L.S., F.Z.S., F.E.S.

(Continued from p. 60.)

4. STEROPLEURUS SICULUS, Fieber (= *idiomenaei*, Luc.).

Resembles the preceding, but smaller, the ovipositor less strongly curved, the sulci of pronotum not black, the anterior tibiae occasionally spined above; subgenital lamina ♀ with obtuse lobes. Length of body, 22mm. ♂, 25mm. ♀; of pronotum, 7mm. ♂ and ♀; of posterior femora, 15mm. ♂, 17mm. ♀; of ovipositor, 16mm.-18mm. ♀.

An Italian species, taken at Cosenza, and in Sicily at Palermo, Messina, and Siracuse.

5. STEROPLEURUS ORTEGAI, Pantel.

Resembles *S. stali* in colour and appearance; the ovipositor is remarkably short for this genus; the shape of the cerci distinguish the male, and also the supra-anal plate. Length of body, 28mm. ♂, 32mm. ♀; of pronotum, 7mm. ♂, 8mm. ♀; of posterior femora, 14mm. ♂, 15mm. ♀; of ovipositor, 15mm. ♀.

The colour of the adult insect, which inhabits *Berberis vulgaris* and *Juniperus communis*, both shrubs with blackish-violet fruit, is blackish-violet. It was discovered in small numbers in the highest parts of the Sierra de Cuenca, by Father Pantel; the localities quoted are Valsalobre and Las Majadas.

6. STEROPLEURUS ASTURIENSIS, Bolivar.

Smaller than *S. stali*, from which it differs also in the shorter ovipositor and supra-anal plate; from *S. catalaunica* and *S. ortegai* it differs in having no black spinule at the apex of the cerci of the male; general colour green. Length of body, 19mm. ♂, 20mm. ♀; of pronotum, 6mm. ♂, 6.5mm. ♀; of posterior femora, 13mm. ♂, 15mm. ♀; of ovipositor, 13mm. ♀.

A native of Asturias, taken by Don Roberto Florez at Candás de Tineo.

7. STEROPLEURUS ANNÆ, Targ. (= *coronata*, Costa).

Small; yellow, with dark spots; the pronotum has a longitudinal black band, and a very deep transverse sulcus; the surface of the disc

is rough. Length of body, 23mm. ♂ : of pronotum, 7.2mm. ♂ ; of posterior femora, 14mm. ♂ .

Occurs in Sardinia. Distinguished by the exceedingly rough pronotum.

8. STEROPLEURUS STALI, Bolivar.

Clear green, to blackish-violet; pronotum not keeled, but convex; metazona longer than prozona, arched; side flaps with lower margin strongly sinuate. Elytra reddish, arched, with coarse venation; ovipositor straight, $2\frac{1}{2}$ times as long as the pronotum.

The mountains of central Spain, Sierra de Guadarrama, etc.

9. STEROPLEURUS POLITUS, Bolivar.

Distinguished from the preceding by the brilliant black on the head and pronotum, nearly dull on the abdomen, which contrasts with the pale yellow of the lower head, feet and belly. The margin of the elytra is not areolated, but consists of a thick ridge. Length of body, 22mm. ♂ ; of pronotum, 6.5mm. ♂ ; of posterior femora, 11mm. ♂ ; of ovipositor, 15mm. ♀ .

Discovered by Escalera in the high mountains at Santiago de la Espada.

10. STEROPLEURUS NOBREI, Bolivar.

Small; greenish-yellow; pronotum almost tectiform, faintly keeled; subgenital plate ♂ sinuate in middle; ovipositor hardly longer than posterior femora. Length of body, 24mm. ♂ and ♀ ; of pronotum, 7mm. ♂ and ♀ ; of posterior femora, 15mm. ♂ and ♀ ; of ovipositor, 17mm. ♀ .

Recorded from the Sierra d'Estrella in Portugal, and taken by the writer near Espinama, in the Picos de Europa (Prov. de Santander).

11. STEROPLEURUS PEREZI, Bolivar.

Characterised by the violet colour and the pale-bordered abdominal segments. Length of body, 23mm.-35mm. ♂ and ♀ ; of pronotum, 7mm. ♂ and ♀ ; of posterior femora, 16mm. ♂ , 17mm. ♀ ; of ovipositor, 18mm. ♀ .

This is a very widely distributed species (for a member of this family); it is also variable in size to a considerable extent. It occurs in Northern and Eastern Spain, from Huesca to El Jucar, and from Burgos to Valencia; the writer has found it common enough on shrubs on the slopes of Montserrat; other localities are Uclès, Dehesa de Arganda, near Madrid, and recently recorded from Alcobaça to Aljubarrota and Condeixa in Portugal.

12. STEROPLEURUS BALEARICA, Bolivar.

Resembles the preceding, of which it is an insular form, but the prothorax is a little larger, and more convex posteriorly, and the colour is darker. Length of body 33mm. ♀ ; of pronotum, 10.5mm. ♀ ; of posterior femora, 22mm. ♀ ; of ovipositor, 21mm. ♀ .

The writer found it in Majorca in a dried-up hedge near Valdemosa, and on shrubs near Porto Cristo, but it does not appear to be common.

13. STEROPLEURUS MARTORELLII, Bolivar.

The elytra are less convex than in *S. peresi*, and the reticulation

is more open; the ovipositor is shorter than the posterior femora. Length of body, 26mm. ♂, 26mm.-30mm. ♀; of pronotum, 8.5mm. ♂, 7.5mm.-8mm. ♀; of posterior femora, 19mm. ♂, 21mm. ♀; of ovipositor, 19mm. ♀.

Never found far from the coast; Barcelona, Ampurdan, Cartega, Almeria.

14. *STEROPLEURUS CASTELLANA*, Bolivar.

Smaller; dark reddish; elytra blackish, with few veins, which are thick and yellow; the grey colour of the elytra predominates, and the areas are larger. Length of body, ? mm. ♂, 18mm. ♀; of pronotum, 6mm. ♀; of posterior femora, ?; of ovipositor, 25mm. ♀.

The male is unknown, and the female exceedingly rare; it is recorded from Burgos.

15. *STEROPLEURUS BRUNNERI*, Bolivar.

Elytra chiefly yellow, owing to the fact that the thick yellow veins predominate over the open areas; the latter are chiefly visible along the border. Length of body, 23mm. ♂, 23mm. ♀; of pronotum, 5.8mm. ♂, 5.5mm. ♀; of posterior femora, 18mm.-20mm. ♂, 20mm. ♀; of ovipositor, 23mm.-25mm. ♀.

Very common in summer in central Spain, on cultivated ground: it occurs as far south as Alcuescar, in the province of Caceres. Bolivar also records a female from Leça in Portugal. According to Father Pantel, it is common at Uclès from the middle of July to the first cold days, chiefly on thorns.

16. *STEROPLEURUS FLAVOVITTATA*, Bolivar.

Green, with yellow spots; large species; the anterior tibiae frequently have three or four spines on the upperside. Length of body, 27mm. ♀; of pronotum, 6.5mm. ♀; of ovipositor, 28mm. ♀.

Only in the extreme south of Spain, Chiclana, Algeciras.

17. *STEROPLEURUS PSEUDOLA*, Bolivar.

Distinguished by the unusually long anterior femora; it is rather a large species; the belly is green with long white stripes. Length of body, 26mm. ♂, 23mm. ♀; of pronotum, 9mm. ♂, 8mm. ♀; of anterior femora, 11.5mm. ♂ and ♀; of posterior femora, 23mm. ♂, 24mm. ♀; of ovipositor, 25mm. ♀.

Southern Spain, Huelva, Cordova.

18. *STEROPLEURUS OBSOLETA*, Bolivar.

Medium size; pale testaceous; the keels of the pronotum are very obtuse; the cerci of the male are sharp, and sinuated on the inner side. Length of body, 32mm. ♂; of pronotum, 8mm. ♂; of posterior femora, 23mm. ♂.

Taken at El Molar, near Madrid; the female is not known.

19. *STEROPLEURUS ANDALUSICUS*, Rambur

(=*andalusius*, Ramb. =*scabricollis*, Ramb. but not *selligera*, Charp.).

Greenish-red; there are two forms; in one the reticulation is feebler, the terminal lobes of the anal segment are not rounded nor sinuate; the ovipositor is one-fifth longer than the posterior femora. In the other form, the lobes of the anal segment are very obtuse; the ovipositor is one-fourth longer than the posterior femora. Length of

body, 25mm. ♂ and ♀; of pronotum, 5.5mm. ♂; of posterior femora, 16mm. ♂.

Spain: Malaga, Granada, Chiclana, Cartagena, Huescar.

SPECIES OF DOUBTFUL POSITION.

Ephippigera elegans, Fischer, has a short curved ovipositor, and deeply, roundly-emarginate, subgenital lamina in the ♂, and the lobes are rounded in the ♀. Length of body, 30mm. ♂ and ♀; of pronotum, 8.5mm. ♂, 8mm. ♀; of posterior femora, 19mm. ♂ and ♀; of ovipositor, 16mm. ♀.

Recorded by Fischer from Rome and the Etruscan Apennines; probably falls in the genus *Steropleurus*.

E. zelleri, Fischer, is dirty olive-green, with black markings. Length of body, 30mm. ♂ and ♀; of pronotum, 8mm. ♂ and ♀; of posterior femora, 19mm. ♂, 22mm. ♀; of ovipositor, 31mm. ♀; also recorded by Fischer from Rome. Probably referable to the same genus.

There is also *S. politus*, Navas (1899), from Tarragona; this seems to be synonymous with some other form, but is not referred to by Bolivar.

The New "Practical Hints."*

The necessity of producing a second edition of the first part of *Practical Hints for the Field Lepidopterist*, has enabled the editor to introduce some very useful subjects which were not included in the first edition of this very helpful volume. To make it a more complete handbook and guide for all sorts and conditions of lepidopterists, seven new chapters of 28 pages have been introduced, dealing with various points with which both beginner and old collector ought to be, and we believe will be, sincerely grateful.

To know what other people do and how they do it, is often a great desideratum. To have other people's experience presented in concise and understandable form is equally so. In these points the new edition will find a welcome from all.

The preliminary chapter provides "the holiday-collector" with a warning as to what he must not forget to take with him on his trip, as well as an account of the details of the necessary apparatus, etc., for ordinary collecting. In the second the various methods of "killing" are fully dealt with, and the different forms are discussed fairly and at length—suffocation *versus* pricking in—each with its "pros and cons."

"Pinning Lepidoptera" is the next subject presented, with a concise note upon the vexed question of "Uniformity of Pinning," so often sought after, but still an unsolved difficulty.

In the third chapter the relative sizes and values of "Entomological Pins" will be helpful to many an old hand who may have wondered why some of his insects have become crazy, or why some of the pins have become mere crochet-needles. The evidence of the tendency to reduce the number of sizes of pins in use is suggestive, and leads us to hope that the makers, when they feel the call upon their productions lessened, may be induced to attempt the improvement of those sizes which are still more commonly called for. It has become a matter of

* *Practical Hints for the Field Lepidopterist*, pt. I (second and revised edition), by J. W. Tutt, F.E.S. [Price 6s. net.] Published by Elliot Stock, 66, Paternoster Row, London, E.C.

wonder with the writer when he reads of the relative reliability of white, gilt, or black pins, that no extensive experiments appear to have been made with sulphuretted white pins—as suggested by Dr. Knaggs many years ago, which promised to retain the point and temper of the original pin.

Upon another vexed question, the “Setting of Lepidoptera,” we are glad to read among the many valuable suggestions, the candid opinion of the editor that English collectors persistently adhere to the old English style. Most of us find it just as difficult to change our style of setting as to change our hand-writing. Many of the wise suggestions in this chapter will, I fear, fall upon deaf ears, whilst many lepidopterists, perhaps, will feel that they fairly carry out one or other of the methods suggested, but, for the beginner, or for one who is really dissatisfied with his work, the suggestions are invaluable.

One could, however, wish that an even more emphatic warning as to the removal of insects too soon from the boards were included. The author insists upon it, but is hardly, it seems, in view of the importance of the matter, insistent enough. The writer has found sometimes that four weeks drying is not sufficient, and that the body may be hard sometimes long before the wings are absolutely fixed in position.

One is glad to read again the emphatic statement of the absolute necessity of sufficient “data labels,” and only regrets that the editor, whilst advising that every insect should be thus labelled individually, states that the enormous work involved in very large private collections often precludes this, to us, absolute necessity. In the case of these very large collections one can understand that this separate labelling would become quite a labour. Yet printed labels are in the market at quite a moderate price, and can be had cheaply in almost unlimited numbers. The side-labelling system alone obviously opens such a possibility to error from misplacement, etc., that it should only be allowed in cases where the better and safer plan is either unimportant, or impossible.

The last new chapter deals with “Holiday Collecting,” and brings home to all readers the advisability of “reading-up” the locality towards which their steps turn, and thus avoid the unpleasant experience of returning without at least some of the prizes of the place.

Of the remainder of the book, which is largely in its original and well-known form, there is no need to speak, except to note the correction of one or two slips that had got into the earlier edition, and the addition of a few useful incidental data to some of the “hints.”—C.R.N.B.

The Colours of Blue Butterflies.

By C. NICHOLSON.

In the course of an article in *The Country-Side*, some little time ago, the editor, Mr. E. Kay Robinson, invited suggestions as to the reasons for the somewhat varied systems of coloration in British “blues.” Being myself too busy at the time to think about it, I let it slide, until, in a recent number, Mr. C. W. Colthrup recorded that he had, on one occasion, noticed a kestrel, and on another occasion a pair of furze-chats, picking male *Agriades corydon* off the grass-stems on which they had settled for the night, and he put this forward as an

instance in which the theory of warning coloration, suggested by Mr. Robinson to account for the colour of the blue males, had failed. This brought the whole question to my notice again, and I now venture with much trembling to "rush in where angels fear to tread"—at least, I gather from back numbers of *The Entomologist* and *The Entomologist's Record*, that they have feared hitherto, as there is no article of any kind dealing with the subject, so far as I can trace—and raise the whole question, with our editor's permission, as a very desirable one for discussion, during which, perhaps, some readers who have been devoting their attention to raking in all the weirdest varieties, aberrations, gynandromorphs, and other monstrosities they can get the net over, rather than to finding out the why and wherefore of the differentiated colouring of their victims, may be able to advance some theories, or, at least, record some experiences, which will help some of our more brainy brethren to put together a working hypothesis.

In the introduction to vol. ii., *British Noctuae and their Varieties*, our editor gives (p. vi.) two tables of genetic development of pigment colours as follows: (1) white, yellow, orange, red, brown, black, (2) white, yellow, green, red (or brown), purple (or blue), black. Now, it is remarkable that our British "blues" can show among them every one of these colours, except yellow, which, I think, is not present in a pure form, say gamboge or canary-yellow, in any species. From this, it seems to me probable that the ancestral "blue" was more probably white than blue or brown, and that the latter colours, the prevailing ones nowadays, were developed by natural selection, for I do not think there can be much doubt that sexual selection, from the point of view of colour, is practically non-existent among butterflies, although I believe it is exercised in at least one other direction; but that is another story.

Now, according to the Darwinian theory, colours are brightest as a rule in the more active sex, and duller in the other, the arrangement being turned to account by sexual selection in one case, and by protective coloration the outcome of natural selection in the other; this, of course, is speaking broadly. Granting then that the bright colour of the male blues is the result of great activity, and that sexual selection plays no part, the two alternatives are: (1) they are blue because they have reached the highest stage of development in colour, or (2) they are blue because blue is a useful colour to them for protective purposes. Assuming the latter is the case, then the blue is either a warning colour, proclaiming their uneatableness; or it is a mimicking colour, causing them to resemble some other creature which is uneatable; or it is a protective colour in the sense that it enables them to escape detection by causing them to appear similar to some inanimate object when at rest temporarily with their wings open. I do not think it can be a warning colour, because as a rule red or yellow, often in conjunction with black, are the usual warning colours adopted by the insect world, and I see no reason to believe that it is a mimicking colour, because I fail to see what there is to mimic. I do think, however, that it may be a protective colour in enabling the butterflies, when settled with wings expanded, to resemble some blue flowers, especially as they often settle on the tops of grass stems or long stalked small flowers, which they entirely hide and take the place of. I also think that, when flitting rapidly about, the blue colour causes a flickering effect,

and so renders the butterflies elusive to any bird with designs on their lives, although I frankly confess that I have never seen a bird attempt to catch a "blue," or even to chase one. These remarks apply more particularly to the males of *Plebeius aegon*, *Everes argiades*, *Agriades bellargus*, *Polyommatus icarus* and *Cyaniris semiargus*, but not to *Agriades corydon*. There is nothing particularly flickering about the flight of this species, so far as I am acquainted with it; I should rather call it floppy. I am at a loss to suggest a reason for its distinct style of coloration, except that it, perhaps, more often frequents exposed places where the grass has grown rank, and has been bleached and partly dried by the sun to a sort of general whitish-green hue which the butterfly resembles. All the females of these species have a strong family likeness, although the blue of their respective lords exhibits so much variety, and I think this points undoubtedly to the adoption of the brown colour (again the highest in its series) for protective purposes, to render the sex less conspicuous, which is helped by their more sluggish habits and more lowly flight. In the case of *A. bellargus* I suggest that the blueness of the females in broods which have fed up in cold and inclement springs, may be due to a weakness of that sex, induced by such conditions allowing the influence of the males to predominate, and so by hereditary tendency cause a suffusion of blue. I understand that "the further south one goes with this species the less blue one gets," and this is due, if my assumption be correct, to the more vigorous conditions of the female under conditions more congenial to their development. I should expect to find also that the males of these southern females are more brilliantly and richly coloured than with us.

Now with reference to the other species, I know nothing of *Lampides boeticus* and *Lycaena arion* in a state of nature, but these, with *Cupido minimus* and *Aricia astrarche*, are distinguished by the colour resemblance between the sexes, as also is *Celastrina argiolus* to a less extent. An obvious difference in habits characterises the last-named species, and I suggest that the brightness of the blue in both sexes is protective in rendering them less conspicuous as they fly round holly-trees against the sky, and in the habit they have of soaring upwards above the holly when disturbed this blueness would also serve them; the colouring of the underside being lighter than the upper, but still blue, is of assistance in the soaring, and being then in shadow to a large extent is brought more into correspondence with the tint of the upperside; it also helps to render them inconspicuous when at rest in the bush. In the case of *Cupido minima*, which is a feeble flier, the dingy colour of both sexes is probably their best protection, but I am afraid I cannot suggest any reason for the striking coloration of *Aricia astrarche*.

The colour scheme of the underside is wonderfully similar in all the species, and seeing that all but one—I think *argiolus* is the only exception—rest or roost amongst grass and herbage, it must be admitted that the greyish or brownish ground colour, broken up by spots and splashes of lighter or darker tints, is admirably adapted to render them inconspicuous amongst the heads of the flowers or seeds of plantains, grasses, rushes and other plants which usually grow in the places they frequent. In the note by Mr. Colthrop above referred to he stated that the birds were picking off the male *A. corydon* only, and that he found the females "much more difficult to see." It struck

me that probably it was the pale worn males the birds were picking off, because these would be much more conspicuous than the females (probably freshly emerged), and even than the fresh males, and as these worn males had almost certainly fulfilled the purpose of their existence by the time they had got so worn, their loss to the species would be unimportant. I would also point out that because two species of birds have been seen to feed on *A. corydon*, it does not follow that it is an acceptable morsel to avian palates in general. The cuckoo is said to eat many kinds of hairy and otherwise unattractive caterpillars, which have been proved to be distasteful by their rejection by many other species.

Such are the ideas which have occurred to me on the colours of "blue" butterflies, and if the editor thinks them worth printing, I shall be quite prepared to find most of them ruthlessly slaughtered in succeeding numbers of the "*Record*." If, however, any one of them should turn out to be not entirely drivell, and should lead to good results in abler minds, I shall feel I have not penned them in vain.

The Orthoptera of Holland, Belgium and England.

By MALCOLM BURR, B.A., F.L.S., F.E.S., F.Z.S., etc.

One of the last publications from the pen of the late Baron de Selys-Longchamps, was the interesting little article (*Ann. Soc. Ent. Belg.*, xliii., 1899, pp. 447-451) comparing the Orthoptera Fauna of Belgium, England and Holland. His authority for the Belgian list was his own work; for the English list, the little book by the writer of this note, and for Holland, a paper entitled "*Orthoptera neerlandica*," published at Utrecht in 1899, by Mr. Tiddo Folmer. Disregarding accidental stragglers and introduced species, the author accounted for 36 British, 43 Belgian, and 31 Dutch species of truly indigenous Orthoptera. The Dutch list has recently been revised by Dr. H. W. Van der Weele of the Leyden Museum ("*Voorloopige Lijst der in Nederland waargenomen Orthoptera*," *Tijdschrift voor Entomologie*, l., 1907, pp. 129-139). It is not without interest to note a few points concerning some of the species mentioned in this list.

DERMAPTERA.—The earwigs are not referred to in either of the Dutch lists, but it is probable that, in addition to the two common species, *Forficula lesnei*, Finot, will be discovered in Holland and also in Belgium, but it is doubtful whether *Labidura riparia*, Pall., is indigenous to either country. *Chelidurella acanthopygia*, Gén  , is far from rare in Belgium, but it remains to be discovered in Great Britain. I have referred to this species as a probable future addition to our list in an earlier paper (*Entom.*, vol. xxxi., p. 125, 1898). *Apterygida albipennis*, Meg., is now known to be numerous in certain localities in our eastern counties; it was recorded from Holland by Snellen van Vollenhoven, in 1846, and is locally distributed in Belgium.

DICTYOPTERA.—BLATTODEA: The three British species of *Ectobia* occur also in Belgium and Holland, and there is little or no chance of any new discoveries in the group in any of the three countries. MANTODEA: *Mantis religiosa*, L., is recorded as an accidental visitor to Belgium. Its distribution extends as far north as Fontainebleau.

ORTHOPTERA.—ACRIDIODEA: *Mecostethus grossus*, L., is indigenous to all these countries. *Stenobothrus lineatus*, Panz., is not recorded by

Folmer, but suggested as a likely native by Van der Weele. It is common in Belgium and local in England. *S. stigmaticus*, Ramb., is locally distributed in Belgium, and recorded as far west as Groenendael near Brussels. Van der Weele expects it to be discovered in Holland, but we may hardly look for it in this country. *Omocestus haemorrhoidalis*, Charp., was found by de Selys in Campine, and is expected by Van der Weele, but it is not probable that it occurs in Britain, though it is found in the Channel Islands. The same remark applies to *O. vagans*, Fieb.: *Stauroderus biguttulus*, Linn., should be carefully sought for in England (see Burr, *Entom.* l.c.), as it occurs at the Hague and elsewhere in Holland, and is common in Belgium. *Chorthippus dorsalis*, Zett., is unknown in Britain and Holland, but has been taken in Belgium near the German frontier. *Gomphocerus rufus*, L., is not yet recorded from Holland though it is common in Belgium, and locally numerous in England. *Oedipoda caerulea*, L., is common in eastern Belgium in the Ardennes and in eastern Holland, but unknown in England, though, like several continental insects, it is common in Jersey. *Pachytylus danicus*, L., is a straggler to all three countries, and is claimed as indigenous in Belgium, and perhaps also in Holland; probably it breeds occasionally in England, as it is sometimes taken in the New Forest. *Psophus stridulus*, L., is a very striking, big, black grasshopper, with crimson wings; it is common in the mountains in central Europe, but it is unlikely that it occurs in Britain, though known as a rarity in Belgium, and quoted from several localities in Holland. *Caloptenus italicus*, L., is a meridional species which is expected, though with little justification to my mind, by Van der Weele for Holland. It is not claimed for Belgium.

LOCUSTODEA: *Xiphidium fuscum*, Fabr., was formally erroneously regarded as British. A single female has been taken in Holland, but it is not known in Belgium. Perhaps the female in question should be attributed to the rare macropterous form of *X. dorsale*, Latr., discovered in Essex by Harwood. *Barbitistes serricauda*, Fabr., is a central European insect occasionally taken in Belgium. It cannot fly, and is not to be expected in England. *Platycleis roeselii*, Hagenb., has not yet been recorded in Holland, and is a great rarity with us. It is rare also in Belgium. *P. bicolor*, Charp., is a central European form doubtfully recorded from Belgium, and expected by Van der Weele. *Olynthoscelis griseo-aptera*, De Geer (= *Thamnotrizon cinereus*, L.) has not yet been recorded in Holland, but it is sure to occur, as it is exceedingly common throughout central Europe, including England. *Gampsocleis glabra*, Herbst, is a striking insect with an erratic distribution from Spain to Russia. It was discovered in the Campine in Belgium, and was a notable addition to the fauna of that country. *Decticus verrucivorus*, L., is common in Belgium, and not rare in Holland, though so scarce in England. *Ephippigera vitium*, Serv., the solitary mid-European representative of this interesting family, was discovered in 1863, by de Selys, in the Campine in Belgium, and is recorded by Van der Weele from Arnhem, in Holland. It is a large, sluggish, flightless creature, and would be a very notable capture were it discovered in England.

GRYLLODEA: Of the crickets there is little to say, except that the three indigenous species seem to be much commoner in Belgium and

Holland than with us. The Mole Cricket is a nuisance in the gardens in Belgium.

Perhaps these random notes may stimulate collectors, and lead to additions to our "British List."

NOTES ON COLLECTING, Etc.

PIERIS RAPÆ AT LARGE IN FEBRUARY.—I thought perhaps it might be worth recording that I captured a nice ♂ specimen of *Pieris rapæ* on the wing on February 13th, 1908, at Ashton Wold.—FRED PALIN, Mill House, Ashton, Oundle, Northants.

PIERIS RAPÆ AT LEWISHAM.—The earliest examples of *P. rapæ* seen here on the wing this year, were coincident with the advent of the fine weather and were observed on May 1st and 2nd.—A. M. COCHRANE.

LEPIDOPTEROLOGICAL NOTES FROM DEREHAM, 1907.—I spent a few days in this locality, in mid-Norfolk, last year, from July 21st-29th. The days were mostly fine and bright, the evenings clear, but cool, except the 27th, when it was mild, but with heavy showers. Very few butterflies were seen, the only one abundant being *Enodia hyperanthus*. Treacling was absolutely useless, not a single moth appearing on the patches on the two or three occasions on which it was tried. A few things were taken on tree-trunks, these being *Lithosia lurideola*, *Triaena psi*, *Apatela aceris*, *Boarmia repandata*, and *Acidalia aversata* and ab. *spoliata*. All these were taken during a visit in the previous year (1906) in the last week in June, or just a month earlier, which shows the lateness of the season, due to the cold and inclement spring. In addition, the following species were taken at dusk on a piece of marshy ground, but the rise of a white fog generally put a stop to collecting, viz., *Nudaria senex* (a few), *Lithostia griseola* and ab. *flava*, *Cosmotriche potatoria*, *Coenobia rufa*, *Leucania pallens* and *L. impura*, *Toxocampa pastinum*, *Asthena luteata*, *Acidalia bisetata*, *A. scutulata*, *A. incanaria*, and *A. immutata*, and *Melanippe unangulata*. In the garden *Eupithecia isogrammaria* and *E. coronata* were taken. It was probably too late for *Cerura bifida*, but a fine one was taken on a beech-trunk in 1906. Larvæ of *Cucullia verbasci* were very small, and those of *Porthesia auriflua* abundant.—W. G. CLUTTEN, 132, Coal Clough Lane, Burnley.

EUROPEAN SPECIMENS OF HELIOTHIS WANTED.—I am desirous of getting some specimens of the European species of *Heliothis* (placed by Hampson in the genus *Chloridea*). If any of your readers have any duplicates of even the most common species, I should like very much to exchange for them any species we may have here in Kentucky that would interest them. I am especially desirous of specimens of *Heliothis armigera* from Europe, though any of the others would be acceptable also.—H. GARMAN, Agricultural Experiment Station, of the State College of Kentucky, Division of Entomology and Botany, Lexington, Kentucky.

FORMICA SANGUINEA IN THE MIDLANDS.—With reference to Mr. Wainwright's note in the March number of the *Ent. Record*, I may say, to prevent any misunderstanding, that my friend Mr. H. Willoughby Ellis and myself have been working nests of this ant together for the past year, and, as we had both pointed out to Mr. Wainwright, before the publication of his note, that our joint paper would appear in the March number of the *Ent. Record*, with the correct records, it seems

that Mr. Wainwright's note is somewhat superfluous. — Alfred H. MARTINEAU, F.E.S., Warwick Road, Solihull. *April 4th, 1908.*

BISTON HIRTARIA AT FORRES.—It may be well to record the fact that I got several larvæ of *Biston hirtaria* at Forres, a new locality, and I believe far north of any previously recorded locality. — J. W. H. HARRISON, B.Sc., 181, Abingdon Road, Middlesborough. *April 6th, 1908.*

MACROTHYLACIA RUBI LARVÆ EATEN BY GULLS.—When I was in South Devon last week, April 18th-23rd, I noticed the gulls pulling out the cocoons of *Macrothylacia rubi*; they tore each open, extracted the larva, pulled it in half, and ate its inside. The larvæ were just spinning up, and I found several on the rocky ledges where the gulls had taken them. — H. M. EDELSTEN, F.E.S., Forty Hill, Enfield. *April 26th, 1908.*

VARIATION.

ABERRATION OF CELASTRINA ARGIOLUS.—At the exhibition of the Lepidopterological Society of Geneva, Colonel Agassiz, of Lausanne, amongst many remarkable aberrations, exhibited a beautiful modification of *Celastrina argiolus* ab. *subtusradiata*, Obth., reproduced in the *Nat. Hist. Brit. Butts.*, ii., pl. xviii., fig. 10. On the underside, the forewings are without spots, but the lower wings have the black streaks even more marked and wider than in Oberthür's example. — (PROFESSOR) C. BLACHIER, 11, Tranchées de Rive, Geneva. *April 26th, 1908.*

SCIENTIFIC NOTES AND OBSERVATIONS.

CROSS-PAIRING BETWEEN PHILOSAMIA CYNTHIA AND CALLOSAMIA PROMETHEA.—I got a pairing between *Philosamia cynthia* ♀ and *Callosamia promethea* ♂ which produced fertile ova, but only two hatched. The rest contained dead, but fully-formed, larvæ. This seems to be an addition to the many successful cases of cross-pairing noted among the *Attacides* in "Hybridisation in Lepidoptera" (*A Nat. Hist. Brit. Lepidoptera*, v., pp. 25-27). — J. W. HARRISON, B.Sc., 181, Abingdon Road, Middlesborough.

CURRENT NOTES.

Mr. E. Simon has been elected Hon. President of the Société Entomologique de France. The previous Honorary Presidents have been Latreille, Dumeril, Dufour and Fairmaire, whose occupancy of the highest post that French entomologists have to offer lasted almost three-quarters of a century.

At the meeting of the Entomological Society of London, held on April 1st, Mr. E. R. Banks sent for exhibition: (1) Four specimens of *Hepialus humuli*, L., more or less covered by a sprouting fungoid growth, which was stated by the editor of the *Field* newspaper, in 1880, to be possibly an early stage of a species of *Clavaria*, and to have attacked the moths after death. Mr. Banks has only met with eight lepidopterous imagines thus affected, and had received one from a friend; all of which appeared to be referable to *H. humuli*. They were found in the heath district of south-east Dorset, mostly attached to shoots of *Ulex europæus*, though *U. nanus*, *Calluna vulgaris* and *Erica ciliaris* each yielded a solitary example. (2) Many dead larvæ of *Hepialus lupulinus*, L., infested with the fungus *Cordiceps*

entomorrhiza, and received from Mr. W. H. B. Fletcher, in whose flower-garden at Bognor they had been found. The larvæ of this species prove destructive there, feeding on the roots of *Helleborus*, *Iris*, *Paeonia*, and, in fact, on everything with available roots, but the infested larvæ were only obtained from clumps of *Paeonia officinalis*, working to the surface during the winter months. The affected larvæ were of two classes: (a) Some show anteriorly much fibrous-net-like mycelium growth, accompanied by a drum-stick-like process often more than half the length of the larva; these larvæ do no work out of the ground, but the fungoid fructification appears above ground, resembling a small reddish toad-stool, and the net-like mycelium seems to anchor the larvæ in their places. (b) Others show no fungoid growth externally, and these work completely out of the soil, and lie about on the surface. Mr. Fletcher suggests that the dead larvæ, perhaps, arrive there through the movement of the soil, resulting from sunshine and rain, frost and thaw, acting on the larval hairs, and allowing a forward but not a backward motion.

At the meeting of the South London Entomological Society held on April 9th, Mr. South exhibited, (1) typical *Cucullia verbasci*, (2) *Cucullia lychnitis*, (3) a considerable series of specimens sent to him from Germany as *Cucullia scrophulariae*, but which he stated were, in his opinion, a mixture of *C. verbasci* and *C. lychnitis*. He stated that he desired information, but believed the *C. scrophulariae* of this country was merely *C. lychnitis*. Mr. L. W. Newman stated that, there was a third very distinct species in England, the larvæ of which he found on the marshes near Dartford, at the same time that those of *C. verbasci* were occurring on the downs in the same district. Mr. Tutt stated that the specimens exhibited by Mr. South were of three characteristic species, the *C. scrophulariae* being, with the possible exception of two examples, correctly named; they agreed absolutely with the *C. scrophulariae* found in Kent, and were most certainly, he thought, neither *C. verbasci* nor *C. lychnitis*. He would roughly suggest that *C. lychnitis* was a "downs" species, *C. scrophulariae* a "marsh" species, and *C. verbasci* largely a "downs" species, but of a wider habitat, and sometimes found on marshes.

Krulikowsky describes (*Societas Entomologica*, xxiii., pp. 2-3, 11-12) a number of aberrations of lepidoptera taken in East Russia. One suspects that some of these may have been described before, e.g., the uniform yellow form of *Rumia luteolata* has, we believe, been described twice already in England. The British species noted are: *Pieris rapae* ab. ♂ *praeterita*, *Pontia daplidice* var. *jachontovi*, *Colias hyale* var. *supercavana*, *Epinephele jurtina* abs. ♀ *huenei* and *illuminata*, *Coenonympha pamphilus* ab. *semilyllus*, *Macrothylacia rubi* ab. ♀ *transfuga*, *Miana strigilis* ab. *amoena*, *Tapinostola hellmanni* ab. *expressata*, *Plusia festucae* ab. *marisola*, *Pseudoterpna pruinata* var. *virollata*, *Larentia montana* ab. *continua*, *Coremia ferrugata* ab. *strandi*, *Pelurga comitata* ab. *ferruginascens*, *Gonodontis bidentata* ab. *edentula*, *Rumia luteolata* ab. *flavissima*, *Venilia macularia* ab. *transversaria*, *Biston hirtaria* ab. ♀ *terroraria*, *Bupalus piniarius* ab. ♀ *fuscantaria*, etc.

At the meeting of the Lancashire and Cheshire Entomological Society, held on March 15th, 1908, an exhibition of *Boarmia repandata* and its varieties took place. Long series of the moth from various localities, chiefly from the north of England and from Wales, were

shown, including rich, dark, mottled forms from Delamere Forest; the greyish-white blotched race with the locally rare melanic aberration (also with white blotches) from Penmaenmawr; melanic varieties from Mansfield and Huddersfield, as well as absolutely black aberrations from Knowsley, Lancashire; the common London forms from Epping Forest and Wimbledon; var. *conversaria* from North Cornwall and New Forest. Mr. Tait stated that, in breeding from extreme forms, about 75 per cent. followed the parents, but pointed out that he had found it difficult to get black varieties to pair. He also remarked how closely the predominating pale form from North Wales resembled the bare rocks upon which it rested in the daytime. Mr. Johnson remarked on the great difference shown by the species in Maer Wood and Burnt Wood, Staffs, localities only four miles apart, those from the former place being chiefly very dark greyish-black, while the latter place gave a lighter and much browner form.

Javet, in Bedel's *Fauna Seine*, i., p. 322, added *Helophorus porculus*, Bed., to the British list, a fact subsequently noted by Champion (*Trans. Ent. Soc. Lond.*, 1905, p. 44). Newbery now states that it is widely distributed in Britain, specimens in the "Power coll." being labelled "Ballmuto," "Moss Morran," "Cowley" and "Esher," whilst "Merton, Surrey," and "Walton-on-the-Naze," are also recorded as localities.

Newbery also notes that examples of *Meligethes viduatus* var. *aestimabilis*, have been taken in Cumberland, by Mr. F. H. Day.

Commander J. J. Walker states that Mr. E. G. R. Waters, of St. Edmund Hall, Oxford, captured a fine example of the American species *Pyrameis virginienensis* (*huntera*) at Luccombe, Isle of Wight, August 26th, 1905. Commander Walker says that this is the third example of this species stated to have been caught in Britain that he has seen. Records of this kind worry one. Walker repeats Barrett's suggestion that these examples reach England "in a quiescent state by means of a ship," but this is not at all satisfactory. It is essentially a southern species, the larvæ confined almost exclusively to plants belonging to the genus *Gnaphalium*. They are very limited in their movements in this stage, and, like *P. cardui*, pupate in a nest formed of leaves of the food-plant. It is double-brooded in its more northern localities, the butterflies of the first brood appearing in July, and of the second about mid-September, the examples of this brood going into hibernation; whilst in its more southern localities it is more or less continuously-brooded, without, so far as is known, any quiescent tendency in the height of summer—July and August. How then does this comparatively sedentary species get here alive, and in fine condition? *Gnaphalium* is not the sort of thing likely to come over in ships.

Mr. Willoughby Ellis, F.Z.S., F.E.S., has been appointed President of the Birmingham Natural History and Philosophical Society for the ensuing year. This large and active society, which has steadily been doing useful scientific work since 1858, is now, amongst other things, engaged in an exhaustive enquiry into the Fauna, Flora and Natural Features of the Midland Plateau.

The society has the following sections:—Microscopical—President, Mr. H. W. Bishop; Biological—President, Mr. E. Clemenshaw, M.A., F.C.S.; Geological—President, Mr. T. H. Walter, B.A., B.Sc.; Geographical—President, Mr. P. E. Martineau; Malacological—President,

Mr. H. H. Bloomer, F.L.S. Owing to the somewhat stagnant condition of the Birmingham Entomological Society, and the consequent small attendance at its meetings, it has been decided by a considerable majority of its members, to accept the invitation of the Birmingham Natural History and Philosophical Society, to amalgamate with it, and form an Entomological Section. The Birmingham Entomological Society has therefore been dissolved, and Mr. G. T. Bethune-Baker, F.L.S., becomes President of the new section, the first meeting of which was held on April 13th.

Aplasta ononaria swarms in the bed of the Eaux Chaudes, opposite the garden of "The Baths," at Digne. If anyone is at Digne this spring (or summer) will he try to get living ♀s or eggs of this species, for the Rev. C. R. N. Burrows, Mucking, Stanford-le-Hope, Essex, as he wishes to rear the species, in connection with the series of papers that he is publishing on the "Emeralds" in this magazine.

We regret to have to record the death of Mr. F. F. Freeman, at the age of 60, at Tavistock. His collection of lepidoptera, we believe, was held in common with that of Mr. F. Lemann, whose regretted decease we chronicled in our last number.

Another volume* of 500 solid pages of information on British butterflies has just been completed, and is being published by Elliot Stock, 66, Paternoster Row, London, E.C., dealing with the life-histories of the British "hairstreaks" and "blues," and illustrated by 28 plates of these butterflies in all their stages—imagines, eggs, larvæ, pupæ, and other details of structure from photographs by Messrs. F. Noad Clark, H. Main, and A. E. Tonge. There has never been anything published, on any large group of insects, approaching the completeness and thoroughness of this work. Up to the present, there has been scarcely any exact knowledge on any of these species published, but this book gives details of almost everything that can be required about the interesting "hairstreak" and "blue" butterflies. Besides this, all students of Palæarctic lepidoptera will find herein the basis on which advanced grouping of the allied species can be arranged. Attention is especially called to the life-histories of *Lampides boeticus* and *Celastrina argiolus*.

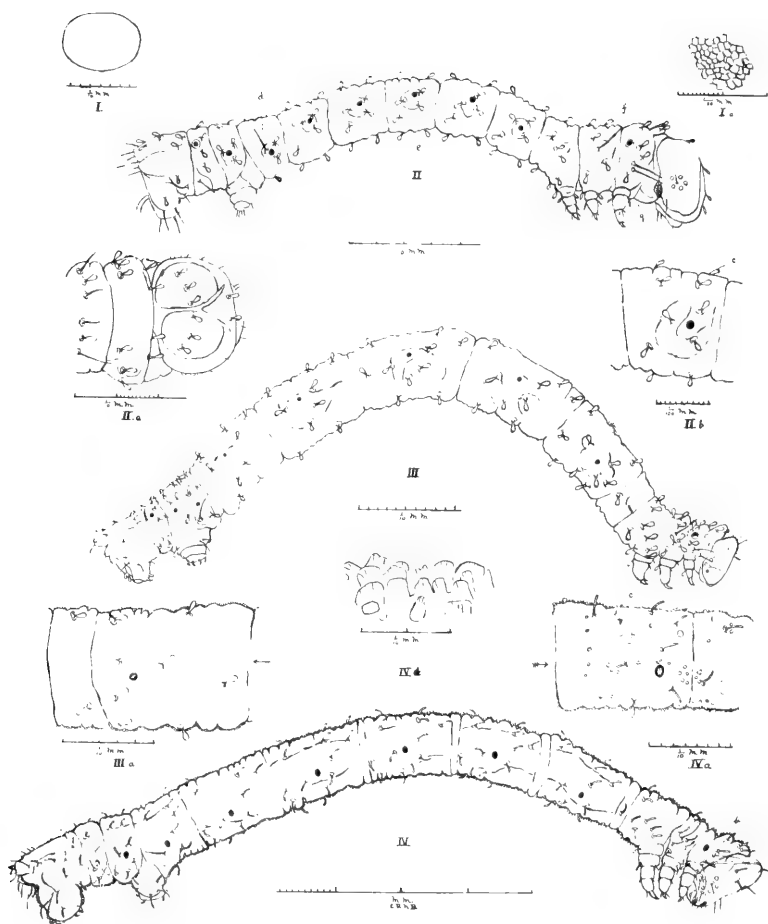
OBITUARY.

John Thomas Carrington.

The death of John Thomas Carrington has removed from our midst the most Bohemian British lepidopterist of our time. He first appeared on the entomological horizon in the late "sixties," as a professional collector in Scotland, where he made the acquaintance of many amateur, and some professional, brothers of the net. Being in London at the time of the death of the late Edward Newman, he offered his services as editor of the *Entomologist*, and, although practically unknown, except for his collecting in Scotland (he had really published nothing), was accepted, and carried on the magazine most successfully from 1876 to 1890, when the magazine, being purchased by Mr. Leech, the editorship fell into the hands of his then

* The *Natural History of British Butterflies, their world-wide variation and distribution*, vol. ii., by J. W. Tutt, F.E.S., 495+x. pp., xxviii. plates and explanations. Price 21s. net. [Published by Elliot Stock, 66, Paternoster Row, London, E.C. Friedländer and Sohn, 11, Carlstrasse, Berlin, N.W., Germany.]

curator, Mr. R. South. Soon after becoming editor of the *Entomologist*, Carrington had accepted an official post at the Westminster Aquarium, and here, in its "palmy" days, entomologists of all kinds foregathered at the pleasant evenings over which he presided, and here he engineered a great entomological exhibition, which fell under the scathing whip of our scientific leaders. Throwing in his lot with the South London Entomological Society, he served many years on its Council, became in due course its president, worked hard for its success, and, in spite of many things, became one of the best-liked members, his popularity being due to his suavity and pleasant manner, especially with beginners. When the *Entomologist* passed from his charge, he became connected with *Science Gossip*, but, after a few years of great, and marked, improvement, the publication was allowed to drop owing, we believe, to insufficient financial support. Strangely, its collapse, we were given to understand, was bewailed by none so greatly as those who read it at Society meetings, etc., but refused their personal quota to ensure its success. From this time the connection of Carrington with entomology was a slender one. He regularly appeared as a welcome guest at Mr. Verrall's annual Entomological Club dinner, but was absent from the last. Our last gossip with him was in January, 1907, when he was as dapper, cheerful, and smiling as ever. A Bohemian of the Bohemians, entomology has lost in J. T. Carrington a man who was keen, alert, and observant in the field, with a wide and thorough knowledge of our native fauna, an all round naturalist of good attainments, who piloted successfully what was, at the time, our only readable entomological magazine, through what might have been a dangerous period, and, doing little himself entomologically, encouraged others to do much, criticising, without discouraging, those who sent him their earliest attempts, but showing clearly that more would be expected, that ignorance was not a virtue, and that the lapses of a beginner were not to be tolerated in an old hand who could not he would, but wouldn't. We have always had deep affection for our old friend. And time has its revenges. In 1908, the year of his death, the Entomological Society of London holds its first conversazione, and with it an entomological exhibition. The bones of McLachlan, Stainton, and others must be turning in their graves at such desecration. The scathing denunciation of the former on "pothouse shows," as unfair as it was uncalled for, the exhibitions as little understood as they were unappreciated, has certainly come home to roost. We ourselves were introduced to the South London Entomological Society at one such show. Our first impression at seeing Lord Walsingham and "Boden" critically discussing a Tortricid, the eager look, keenness and anxiety depicted, was an object lesson we trust never to be forgotten. Let those laugh who win—Carrington was, perhaps, in this matter, a quarter of a century ahead of his time. We, who know, are quite aware that scientific exhibitions need not be vulgar, and that the surroundings have little to do with the matter. We could have wished that Carrington had been at the Entomological Society of London's first conversazione and exhibition. We should have enjoyed with him the memories, which, to many, fortunately, are still an open book, something to be pleased with, something to be smiled at, something even to be proud of.



Del. C. R. N. B

NEMORIA VIRIDATA, LINN.



1

CLEOGENE PELETIERARIA—EGGSHELL ($\times 100$) AND MICROPYLE ($\times 250$).

2

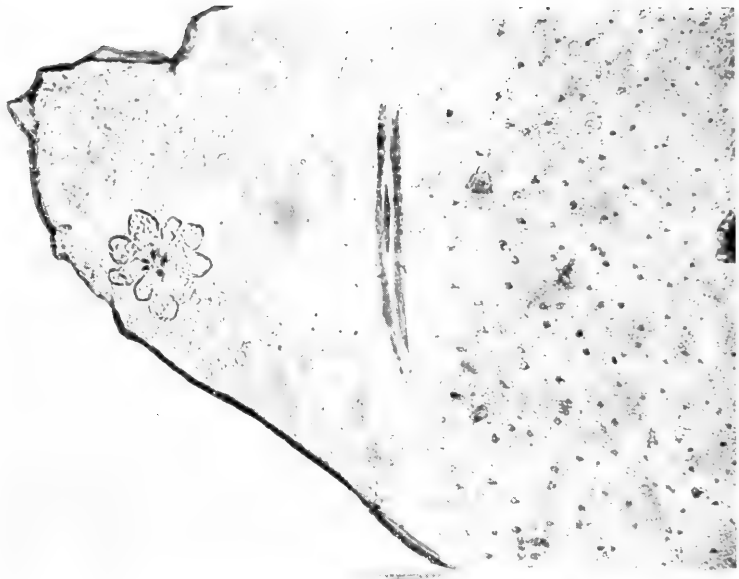


Photo. F. N. Clark.

The Lepidoptera of Ticino—Piotta.

By J. W. TUTT, F.E.S.

Still the fine weather held for us, and, on the morning of August 4th, we determined to walk down the valley, the Valle Leventina, and so soon as we left the town behind, and passed through the well-known natural archway, sport began. The path lay well above the river, which here passed through a large alder carr, down to which flowery slopes formed an ideal ground for butterflies, but, above the road, the slopes present a marvellous stretch, possibly continuous for 4000ft. elevation, up past Brugnasco, to the summits around Piora, and perhaps this is why one seems to be able to collect so many insects on the slopes here, and why a mixture of somewhat high and low forms occurs together. The descent, too, as one walked down the valley, appeared to be noticeable, for the hot sun streamed down in glorious fashion, making one feel more decidedly than for a long time past that this world of ours was a splendid place to live in. Some people like wet, and cold, and east winds, and other things that they call "bracing," etc. I don't.

At first there was nothing very special. *Agriades corydon* was in numbers, *Parnassius apollo* abundant, a few *Melanargia galathea*, and an occasional *Erebia aethiops* and *Melitaea didyma*, but a bend in the road was sufficient to bring the fauna of the district into view, not, perhaps, a really great variety of species, but an abundance of specimens of the species there. *Melitaea athalia* (or at any rate the insect we think such) with *Melitaea didyma*, *Melanargia galathea*, *Erebia aethiops*, *Parnassius apollo* and *Argynnis aglaia*, were on every flower-head, their wings down in the hot sun, and the *M. didyma* looking like coppers as they flew from flower to flower, and vying with *Heodes virgaureae* the ♂s of which were also common. A corner gave *Plebeius argus* and *Aricia astrarche* in abundance, whilst a large dark heavy blue hurrying up the bankside disclosed *Lycaena arion*. The insect here was exceedingly swift and active, and the *Parnassius apollo* seemed particularly large and white. *Argynnis niobe*, too, was frequent, and so were worn *Brenthis amathusia*. *Aglais urticae* appeared to be the only Vanessid, until a lovely freshly-emerged *Polygonia c-album* was netted from a scabious bloom, and, on the wall at the bottom of the bank, two or three empty pupa-cases of this species were observed. This road-side wall was covered at its edge with *Galium*, on which was an abundance of larvæ of *Sesia stellatarum* of various sizes. Some of the smallest were selected but every one turned out to be ichneumonid. On the wall also two or three empty Melitæid pupa-cases were noticed, and a few unemerged ones of *Aglais urticae*. The bank below led down to a flat (considerably grazed) through which the river flowed, whilst, at its lower end, this flat was filled with a dense alder carr, on the borders of which *Eupatorium* and other flowers loved of insects abounded. This was a spot beyond which one need not go for many an hour, if one were so disposed, for here, with nothing special, the British fauna had congregated. A large ♀ *Papilio machaon* flew busily along the bank a foot or two above the ground, now and again hesitating, almost settling, and going on again; one feels satisfied that she is busy egg-laying when a suitable spot shall have been detected; *Aporia crataegi* was in abundance, but going over, the ♀s too transparent in the centre of the

JUNE 15TH, 1908.

wings for freshly-emerged examples, the ♂s rather worn; at present they were busy feeding, or sitting with outspread wings basking in the sun, the forewings pulled back *Parnassius*-like over the hindwings, which, in turn, were folded over, and covered in, the abdomen. On the edge of the carr, *Leptosia sinapis*, spring examples of good size, with one undoubted ♂ of the summer emergence that had caught up its uncles and aunts, slowly threaded its way through the undergrowth or entered the breaks in the bushes to pass, as it were, into the shade, but quickly returned to the bright sunlight again. But the fritillaries were the glory of the corner. Hundreds of ♂ *Dryas paphia* sported from every flower, in the full beauty of recent emergence, many possibly that very morning; they soared over and around the alder-bushes, and came back to disturb the peace of the dozens of *Argynnis niobe*, its *ab. eris*, and *A. aglaia* that were bent on feeding. Very active also were the *Brenthis amathusia*, which kept to the little hollows on the borders of the alders, and were most fiercely attacked by their near relatives, the somewhat smaller *B. euphrosyne*, which were mostly on their last legs, although some of the ♀s were yet fair. Again and again we were attracted to the bank to take just a few more of those lovely *Melitaea didyma*, some with yet limp wings, basking in the pleasure of slothful indolence in the hot sun, with the equally fresh and beautiful *Melitaea athalia*, of the mountain form. How that bank did swarm with "burnets," chiefly *Anthrocera purpuralis* and *A. lonicerae*, but with a fair sprinkling of lovely *Anthrocera carniolica*, one with beautiful orange hindwings, *A. transalpina* and *A. ochsenheimeri*, now buzzing furiously in the hot noonday sun. On the path, a fierce rush, suggested a ♂ *Lasiocampa quercus*, and another was seen investigating a ledge far above, where we suspected a ♀, either on the point of emergence or recently emerged and now gone, for the ♂ returned two or three times to the same spot. Leaving it and doubling back the insect was in the net, a ♂ of rather deep chocolate hue. A few ♀ *Pararge maera* were also noted, and then, towards the end of the bank, observation on the habits of *Lycaena arion*, a rather large dark mountain form commenced, but the notes on this species are too long to be given in detail here, and must be reserved for an account of the species in our *Nat. Hist. of Brit. Lepidoptera*. Tumbling over the banks from above, one discovered, now and again, *Setina aurita*, of beautiful golden colour and of spotted form, whilst one kicked up by the roadside *Merrifieldia tetradactyla*, the only plume species observed here, whilst almost to the bridge *Hesperia alveus* was very abundant, and a concentration of *Aricia astrarche*, *Plebeius aegon*, *Polyommatus icarus*, *P. hylas*, *Cyaniris semiargus*, and *Agriades corydon*, gave more material for our special work; three common British species of "skippers," *Adopaea flava*, *A. lineola* and *Augiades sylvanus* reminded one of our observations on these same species far away two years earlier at Bourg St. Maurice. Here was the latter species egg-laying in just the same manner, *Adopaea flava*, worn, almost all ♀s, and one would have thought certain to have given an egg, yet resolutely refusing to do so, with *A. lineola* only just emerging, and more intent on feeding than anything else. Back again to the edge of the alder-carr, through a surfeit of many species, we at last got round on the flat, and found a lovely glade about 5 or 6 yards in width, and perhaps 200 yards long. The floor was covered with flowers in their fullest beauty, and the alder arched above, but not so as to

exclude the hot sun. Newly-emerged examples of all the species on the bank were abundant, and, in addition, *Loweia gordius*, the bright southern ♀ of *Heodes virgaureae*, and a single specimen of *Chrysophanus phlaeas*. The ♂s of *Heodes virgaureae* were neglected, but the ♀s, with exceptionally long elongated spots on the forewings, were in the pink of condition, and, for a while again, time and everything were lost except the satisfaction of one's surroundings. The peculiar dark hindwing variation of *H. virgaureae* and its parallelism in other species of this group are worthy of a separate paper. A scuffle over the bright blossom, and the big bee in my net is transferred to a box, a late but yet good example of *Hemaris fuciformis*. Another and yet another, but both worn, and, as I looked round, straight up the glade a lovely *Apatura iris* sailed in its first splendour. Here were Chattenden Roughts' thoughts uppermost, and, as I stood quite still, whilst the beauty came on, the old excitement arose, and I felt I was on the point of missing, but no, a sudden movement and the insect was in the net, and a moment later in the box, a ♂ evidently emerged that very morning. The sides of the glade literally swarmed with *Erebia aethiops*, whilst the two "browns" of the district, *Epinephile lycaon* and *E. ianira* were abundant, the former particularly so. Among the "coppers" were some *Coenonympha* var. *darwiniana*, but the species was going over. Space was getting scarce, and taste grew inversely proportional in its fastidiousness. One could not carry away all the inhabitants of the alder carr, and it is well that this is so. One hopes that, in the ages to come, the same pleasure that was ours this lovely summer morning, will be that of some unknown successors to whom our tastes and our aspirations are strangely handed on. We slowly climb the bank again, look regretfully at the swarms of lovely butterflies, one or more on every flower, and then dart down again. One must really have that lovely *calesina* that flaunts its iridescent wings with the pupal fluid almost moist on them, and then one crosses the bridge and gets on the road to Piotta; but what entomologist can walk on paths when a wide flat waste runs for nearly half-a-mile alluringly by, when large alder-trees skirt the river, now ever increasing its distance from the village by a large bend. On the flat and over to the alders, we will at least wander on the waste whilst we can, but the real wealth of the insects has been left behind. *Argynnis niobe*, *Epinephile lycaon* and *E. ianira* are more abundant than ever; *Lycaena arion* occasionally skips over the flower-strewn way, *Loweia gordius* is on the thyme, with the dark purple *Cyaniris semiargus*, *Plebeius argus*, and a single ♀ *Aricia cumedon* with the bases of the underside of the wings scattered with brilliant blue. I walk up to an alder, my instinct was right, late as it is the resting moth is *Hypsipetes impluviata*, and there is another and yet another. Rather dark *Eubolia bipunctata* come out from the coarse herbage, and a pale whitish form of *Minoa euphorbiata* insists on being noted. But the afternoon is here, 2 p.m., and under the shade of an alder we sit and eat our fragal lunch, and soon afterwards we wander into Piotta for a drink at the parish pump. Then we saunter back again, and take a long time to crawl over those four miles between us and Airolo. How we looked at the alder carr, and wondered why we still must go down into that glade once more. How we picked up the biggest and finest *Parnassius apollo*, just to see if they had not got extra red spots you know, and how regretfully we let them go again.

How we searched and found full-grown larvæ of *Hemaris tityus* (*bombylifomis*) on the scabious, and how, about 4 o'clock, the butterflies were so restful that one could put away one's net, and pick them off the flowers in dozens with one's fingers had one been so disposed. It was a perfect collector's day, "the" day of the 1907 holiday, and as one at last made room for the newly-emerged *Gnophos glaucinaria*, now resting on the stone-walls, one felt one must resist temptation and go. And so, an hour afterwards, one finds oneself washed and refreshed, seated at the table overhauling and setting one's captures, and preparing to make room, as it were, for the possibilities of another day.

Nemoria viridata, Linn. (with plate).

By (Rev.) C. R. N. BURROWS.

I must commence by admitting that this insect is one with which I have no personal acquaintance, except that I once (May 29th, 1890) found a freshly-emerged specimen at Brockenhurst, resting exposed upon a grass stem, at mid-day, but, in the execution of my scheme of investigating the early life of the "Emerald Moths," I cannot pass the species over on this account, and have, therefore, taken advantage largely of the experience of other collectors, who have, in this respect, been more fortunate than myself.

It appears scarcely likely that I shall be able to proceed much further than the examination of this group, yet it would be extremely interesting to discover from the early larval resemblances, how far our arrangement of species is correct. For instance, Staudinger places *Aplasta ononaria* at the head of the *Geometrinae*, to be immediately followed by the so-called "Emeralds." I have no idea as to his reason for so doing, and I should wish to discover how far the early stages in that species agree with the grouping, but, in spite of Dr. Chapman's kindness in sending me larvæ from the South of France, I did not succeed in rearing them, and so failed to get eggs. Again, after the "Emeralds," Staudinger places the *Acidaliinae*, and I should much like to know how far their early structure agrees. I mention these wishes because I am much inclined to think that, with the species now before us, we are leaving the more specialised forms, and sinking to what I understand to be more like the early structure of the *Acidalias*. I was originally urged to the study of this group by the interest excited in the clothing-habit of some of the individuals, and as far as I can see, I come to the conclusion that, with *Hemithea aestivaria*, we have finished the species, which either clothe themselves or are provided with special hairs to which silken threads, and also foreign matter, may be attached. I cannot yet speak positively of either *Geometra vernaria* or *Pseudoterpna cytisaria* (*pruinata*), although the necessary material is at hand, and I still hope to be able to examine *Thalera fimbrialis*, whose occurrence in England has been recorded.

My choice of *Nemoria viridata* as my next subject, was brought about by its imaginal resemblance to *Hemithea aestivaria*, but, as we shall see, this similarity does not altogether extend to the young larva.

As usual I have to commence with synonymy, for which, as always, I have to thank Mr. L. B. Prout, who recorded his conclusions in a paper on "The Synonymy of the Emerald Moths" (*Entomologist's*

Record, vol. xii., p. 181), which notes, with his later comments, I take the liberty of reproducing. These read:—

VIRIDATA, L., "*Syst. Nat.*," ed. x (1758).—Werneburg argues at great length that this is really *strigata*, Müll., but his arguments are so weak that I will not even waste space by quoting them. Scopoli, in 1763, Schiffermüller, in 1775, and a host of others, rightly recognised Linné's species, and his type specimen is still extant, confirming the identification. *Viridata*, L. (*nec* Werneburg), stands, therefore, for the species so named.

This accounts, as Mr. Prout points out, for the emphatic note, "*certo*," in Staudinger's *Catalog*, ed. 1901, p. 263, in connection with this species, the note being rendered necessary by the futile quibbles of synonymists, who knew little of the true state of the case.

Linné's own description of the type of *N. viridata* reads thus:—

"*Viridata*.—*Geometer* with setiform antennæ, all the wings angulated, green, a white line. Habitat in oak. Resembles Roesel, i., phal. 3., tab. 13 (*i.e.*, a poor figure of *H. aestivaria*, L.B.P.), but with a single line, and concolorous margin."* Further, in the *Fauna Suecica* he adds: "Small, slender, all the wings green above, with a pale line and the costal margin yellowish."† He then, unfortunately, cites Harris' figures (*Insects*, vii., pl. 3, e-i). Now, these figures, Mr. Prout assures me, unmistakably, if rather roughly, represent not *N. viridata*, but *H. aestivaria*: "but" adds Mr. Prout, in his letter of explanation, "we know Linné was a very bad hand at identifying species from figures, and constantly gives erroneous citations. Hence one of Werneburg's strongest arguments collapses. But all questions are set at rest by the existence of Linné's own type specimen." This specimen Mr. Prout describes as "a poor one, faded to yellowish, and so sprung that it is difficult to see what it is like. But the unspotted margin, etc., show clearly what species it is, and, although its hindwings are a little more angulated than in a good many *viridata*, they are not more so than I have seen in that species."

Examining Staudinger's "*Catalog*," Mr. Prout has helped me to the following particulars. As a synonym of *viridata* he gives *cloraria* Hb., *Eur. Schmett.*, fig. 352, with a reference to Guenée. This is a good aberration, having two transverse lines on the forewing, as against the single line of the type. Next there is a var. *insignata*, Staud., from central Asia, with the white lines absent, or almost so, "*alarum lineis albis obsoletis vel subnullis*." Such a specimen I have never seen, nor have I heard of such being taken in England.

As a separate species, but with a query, we have, *melinaria*, H.-S., fig. 413, founded upon a single male specimen from the Urals, and suspected by Staudinger to be only an aberration of *viridata*, but no description is forthcoming unless Mr. Prout can manage to find it. Lastly, comes an insect considered by Zeller to be worthy of specific rank, *viz.*, *porrinata*, Zell., but, in Staudinger's judgment, merely a "Darwinian species," "*præc. forma Darw.; in coll. sæpe confusa*." Mr. Prout tells me that this is commoner in some parts of Europe than the species before us. He says, "Terribly like *viridata*. Its

* *Geometra seticornis*, alis angulatis omnibus viridibus; striga pallida. Hab. in quercû. Similis Roesel, I., phal. 3, tab. 13, sed linea unica et margo concolor (*Syst. Nat.*, ed. x., p. 523).

† Parva, tenera, alæ omnes virides supra striga pallida margineque crassiore flavescente (*Fauna Suecica*, ed. ii., p. 330).

chief distinctive features being its brown-spotted costa, and brown marked front legs. It is perhaps a bluer-green than *viridata*." Having examined specimens of this insect, I confess that I can with the unassisted eye see no difference from *viridata*.

I have said that, having no knowledge of *Nemoria viridata* myself, I have been thrown upon the resources of my friends, whose good fortune has enabled them to observe the insect in its very restricted haunts. It appears to require generally a damp, perhaps a boggy, situation (although, as so often happens in nature, it sometimes quite contradicts its accustomed habits), and also to be exceedingly local even where it does occur.

I have carefully collected, and digested, all the records available to me, from which it appears that it is entirely confined, so far as the British Isles are concerned (except the Channel Islands?), to England. I find no mention of its occurrence outside, except Meyrick's "E. Ireland, local," though Kane, in his "Lepidoptera of Ireland" says that, in every case in which specimens were sent to him as this species, they always proved to be *H. aestivaria*. In England, there appear to be certain centres to which the insect clings, roughly speaking, north, south, east and west—Witherslack and the neighbouring moors or mosses stand for the northern habitat. The southern and western localities appear to form a broken belt—commencing in Surrey and Sussex. It appears again in force, first in the New Forest and neighbourhood, then at Poole, Bournemouth, Boscombe, Torquay, Dartmoor, Bovey-Tracy, Bloxworth and Barnstaple. I have even found a record from Bath, but that possibly points to some locality available by train. For the eastern habitat I have the authority of Mr. Edelsten for adding the Norfolk Broads.

I may add that Dr. Chapman in his note on "The Distribution of Insects" (*Entomologist's Record*, vol. xi., p. 64) includes the insect amongst those which do not care to reside at the seaside.

As to the food-plants of *N. viridata*, Newman gives hawthorn; Meyrick *Rubus* and hawthorn; St. John records bramble and white-thorn; Merrin and Stainton the same. I have purposely avoided placing these authorities in chronological order because their agreement appears to have resulted from copying. Edward Newman publishes (*Entom.*, vol. v. (1871), pp. 383, 415), a description of the larva as feeding upon osier, and at the same time discusses the question of its identity with *porrinaria*, Zell., or even the occurrence of the latter in England, to the exclusion of *viridata*. To this Hodgkinson replied that, at Witherslack, osier cannot be the food-plant as it does not occur in the locality, and suggests *Myrica gale*, as more likely. He speaks of having taken 20 dozen specimens at one time, and adds that he once took "two fine yellow varieties." Mr. A. W. Mera tells me that he has reared the larvæ successfully upon knot-grass. Dr. G. G. C. Hodgson has experimented largely upon the subject. Having gathered all possible low-grown plants (except grass and sedges) from the restricted locality where he had captured the moth, and placed the larvæ upon them, he found that the plant selected for food was *Potentilla tormentilla*, which is unfortunately a more unsatisfactory plant to deal with, as it will not keep fresh in water for three days. Yet one more food-plant presents itself. The Rev. F. E. Lowe writes (*Entom. Record*, x., p. 18): "With us (*i.e.*, in

the Channel Islands) *Nemoria viridata*, as far as I know, always lays its eggs upon the young shoots of common furze (*Ulex europæus*). Its habitat is exclusively amongst furze on the cliffs by the sea. It mostly abounds on those places when there is a second year's growth, after the furze has been cut down for fuel as is customary here."* Calling Dr. Hodgson's attention to this record, he writes me that, in his localities for the species, neither *Ulex* nor *Genista* forms a conspicuous part of the vegetation, but that, in August, 1905, in these localities, larvæ were swept from a mixed herbage consisting chiefly of heather, *Genista anglica*, and *Tormentilla*.

It is, therefore, quite evident that the larva has many food-plants, and does not confine itself to low-growing plants. Mr. Mathew finds that the larvæ thrive upon the strong young shoots of whitethorn, which keep well in water, and my limited experience coincides with his.

I have little information as to the life-history of the insect. The egg which I have numbered fig. I in my drawings (pl. x), and more in detail, from an empty egg-shell, as fig. Ia has, as far as I know, never been satisfactorily described. By my measurements it appears to be about $\cdot 72\text{mm.} \times \cdot 55\text{mm.}$ and rather large for so small an insect. Ova, received from Dr. Hodgson, which were laid on June 6th, 1906, hatched out in my possession on the 15th; nine days seems but a short oval stage, but is not unusually so. Mr. Fenn, in his most valuable tables of the "Duration of the oval state in the Geometers" (*Entom. Record*, vol. iii., 1892, p. 174), gives *Geometra papilionaria* from 5 to 16 days, and Dr. Buckell (*loc. cit.*, p. 255) gives *Hemithea aestivaria*, 9 days. These periods are not the shortest on record, but I quote species considered to be closely related to that which we are studying.

When first laid the egg is much the same colour as its mother, but it soon changes to yellowish, and there is no further alteration except, perhaps, a slight opalescence before hatching. The newly-emerged larvæ are orange-yellow. Some, after hatching, proceed to devour a portion of the egg-shell, others show no taste in that direction. They are full-fed from mid-August on to late in September, and then proceed to enclose themselves in a close "box" of dry leaves, in which they pupate in a horizontal position, and attached by the anal hooks. Mr. Mathew remarks upon the lengthy larval stage, and Dr. Hodgson writes: "Many feed for three months, and some more." Having passed the winter in the pupal state, the perfect insect emerges from the end of May to the beginning of July. It will be noticed that this habit of hibernating in the pupa is novel, so far as we have yet studied the "British Emeralds."

I can find no record of a second-brood which would not perhaps be unlikely to occur if only the larva would feed up more rapidly.

The imago may be found at rest by day, and is easily kicked up from its shelter, but its natural time of flight is dusk. I do not find that it comes either to light or to sugar, as most of the other "Emeralds" do. In captivity it is restless, and not to be trusted. Dr. Hodgson

* The ♂ genitalia of one of these specimens kindly sent to me by Mr. Lowe appear not to agree with those of *N. viridata*.—C.R.N.B.

has counted 80 eggs laid by one female, but I have no doubt she would have laid many more if at liberty.

The colour of the imago is most fugitive, unless the specimens be carefully killed as soon as possible after emergence. Once set and dry they do not appear to alter much, within a reasonable time, except, perhaps, by losing somewhat of their lustre. The Rev. J. A. Mackonochie refers to this fading (*Entom. Record*, vol. iv. (1898), p. 109), and writes, "I have noticed in *Nemoria viridata* the extreme paleness of the upper-wings in many specimens, which have been flying at the same time as others with the upper-wings of the normal beautiful colour, and have been puzzled to account for the fact. Possibly these pale specimens have been on the wing longer than the normally coloured ones." It has also been noticed that these faded specimens are often in quite as good condition, sometimes better, than the green ones. Mr. Grosvenor accounts for this paling of the upper-wing in preference to the lower, by referring to the resting-position of the species, in which the habit is to drop the upper-wings over the lower, and thus shield them. Dr. Hodgson would add dampness to light as the cause of this destruction of colour, as he has found with bred specimens kept indoors for breeding purposes, and exposed to daylight, even to a little sun-light, that they died natural deaths, without loss of colour. In my opinion this is the correct explanation, and I do not believe that specimens thus coloured have ever been bred. This faded colour is peculiarly disagreeable to the eye, a dirty yellow-pink, most uninteresting, and always a great disfigurement to a series.

Apart from the two aberrations mentioned by Staudinger, I found no other notes upon the variation of the species. The Linnean type has, we have seen, but one transverse line on both upper- and under-wing. Meyrick's description, which is full and modern, refers to *ab. cloraria*, Hb., but I quote it as a basis with which to compare the other forms:—

Face red-brown, fillet white, crown light green. Antenna of ♂ filiform. Forewings light green, costal edge whitish-ochreous. First line faint, curved. Second nearly straight, whitish. Cilia white, basal half pale greenish. Hindwings as forewings, but first line absent. Termen very obtusely angulated.

I suggest the following arrangement of the various forms:—

1. *N. viridata*, L.—Only one transverse line on each wing.
2. *ab. cloraria*, Hb.—Two transverse lines on upper wing.
3. *ab. insignata*, Staud.—Transverse lines obsolete or nearly so.
4. *ab. rufotincta*, n. ab.—Forewings with distinct red central flush.
5. *ab. mathewi*, Banks.—Fore- and hindwings dusted with orange scales.
6. *ab. olivaceo-marginata*, n. ab.—Fringes of all wings dark olive-green.
7. *ab. concavilinea*, n. ab.—Line on hindwing concave outwardly.
8. *ab. caerulescens*, n. ab.—Of decidedly blue-green colour.

Of these forms one or two call for special notice, *viz.*—

4. *ab. rufotincta*, n. ab.—The remarkable specimen which I chose as exemplifying this striking aberration was bred by Mr. G. F. Mathew amongst others from eggs obtained from Bovey Tracy. It passed at Mr. Mathew's sale into the possession of Mr. E. R. Banks, but was unfortunately lost in transfer. The red fascia was most distinct, and so puzzling that I concluded at first that it was stained. Yet the flush was far too uniform and symmetrical for this explanation, and, upon enquiring from Mr. Mathew, he sent me, amongst others, three

specimens from the same brood, which suggested the form, but would not bear comparison with the original.

5. *ab. mathewi*, Bankses.—Since writing the above, Mr. Banks has examined his specimens carefully, and has found material to establish *ab. mathewi* (*Entom. Record*, vol. xix. (1907), p. 210). He writes: "The points of distinction from all named forms are—both forewings and hindwings dusted with orange scales. These are fewest towards the bases, but become exceedingly numerous posteriorly, and are especially noticeable between the subterminal line, and the termen of the forewing, and the corresponding portion of the hindwing. In the five examples examined, the thorax also differs from that of the ordinary forms, being of a dingy greenish-buff, and the actual ground colour of the wings is rather paler, and somewhat tinged with dingy buff.

This description does not in any way cover the specimen which is lost (= *ab. rufotincta*). I made my observation in the semi-darkness of the auction room, but made a note of what I saw. I described the specimen in my note as red-flushed, and this seemed to agree with the opinion of the two or three to whom I pointed it out. I much regret that another engagement prevented my remaining in the room, and I was compelled to leave long before the sale commenced.

6. *ab. olivaceo-marginata*, n. ab.—This is a form in which the insect may or may not be purely typical, but the fringes of all the wings are dark olive-green. There is such a specimen in Mr. Sidney Webb's collection, which is labelled as from the Witherslack locality. This form is parallel with the aberration of *H. aestivaria* in Mr. Prout's collection, in which the spotting of the cilia has become continuous, and which is mentioned in my paper on that species.

7. *ab. concavilinea*, n. ab.—A form in which the single line on the hindwing is reversed, that is to say, it is bent towards the base instead of as usual, away from it. This form appears to be far from uncommon. One wonders how it comes about that lines can be turned back in this manner, and recalls one of the distinctive differences between *Lasiocampa quercus* and its var. *callunae*.

8. *ab. caerulea*, n. ab.—This blue-green form seems to occur in all the "Emeralds," and makes a striking feature in a series of the insects when viewed in a good light.

The distinctness and brilliancy of the transverse lines vary much. They are generally entire or nearly so, but sometimes made up of lunules. There is also a considerable difference in the distance apart of the two lines where two are present. Of 23 specimens, which at present form my series, only one agrees with the Linnean type. I do not infer from this that the single-lined form is rare in England, for I have no means of ascertaining. Of my specimens, seven are of the faded yellow-pink description with little of the original green remaining.

So far for the imago, I turn now to the young larva. Meyrick's description of the full-grown larva is:—

Pale green, with purplish dorsal, sometimes connected, marks. Subdorsal line whitish, lateral flange pale yellow. Head purplish.

And, in the generic diagnosis, he places *Nemoria viridata* with *Hemithea aestivaria* in the genus *Nemoria*, he describes the larva as "transversely wrinkled, with the head and 2nd segment (i.e., 1st thoracic) bicuspidate."

My drawing of the young larva as it leaves the egg (pl. x., fig. ii) shows a much simpler creature than those which I have dealt with previously. The peculiar hairs which have been so noticeable in the other species, are now no longer in evidence. With this exception the larva differs little from the rest. The lateral flange is present but much less developed, and more broken up. The special hairs which mark the tubercles are but slightly enlarged, and I think flattened, short and club-shaped. I have drawn the head and first thoracic segment from a vertical point of view (pl. x., fig. iia), and cannot see, at this stage, much sign of the bifurcation which is so distinct at a later stage, yet, from the side view, the projection upon the first thoracic segment shows a slight indentation, and I must suppose that the processes of pickling and mounting have filled up the groove. I have also enlarged the first abdominal segment, more because I always do so, than because it shows any particularly interesting details (pl. x., fig. iib).

I am unfortunately unable to feel quite certain as to the exact age of the other larvæ depicted. The next drawing (pl. x., fig. iii), shows probably a well-grown larva in the second instar. It has quite assumed adult form. The white spicules which are so beautiful in the larvæ of *Geometra papilionaria*, and still more so in *Hemithea aestivaria*, are here also plainly visible, although they appear to be less regular, and more nebulous than at a later stage. The bifurcation of the head and first thoracic segment are now quite distinct although they do not appear in my drawing. The curious development of a sort of forest of clear plates or leaves, extending from, or standing upon, the skin in parallel lines, more noticeable at a later stage, now begins to show itself. The lateral flange is not very distinct except in the spiracular region.

I have here again drawn the first abdominal segment on a larger scale (pl. x., fig. iia), but no new feature appears, unless perhaps, it be the difficulty I have found in determining the point at which the segment commences anteriorly.

My last figure (pl. x., fig. iv), must, I think, represent the final instar, although I have no absolute information on the point. It was killed on July 26th, and so might have had a month or more to grow.

Here we see the granulations or spicules very distinctly, and I have tried to make them clear in my drawing of the first abdominal segment (fig. iia). This is not the best marked segment, but enough is shown to represent the important part which these particles bear in the ornamentation, producing the "subdorsal line whitish, lateral ridge pale yellow," of Meyrick's description (fig. ivb).

The transparent plates springing from the body are depicted (fig. ivd), as they appear upon the dorsal edge. It is quite evident that they are set in parallel rows, which follow one another down the sides, so that from any point of view those in front appear shorter than those immediately behind.

I have observed silken threads entangled amongst these plates, and no doubt they do, from their closeness and irregularity, entangle any object which may come in contact with them.

The tactile hairs are quite evident upon the 6th abdominal and 2nd thoracic segments, and it is very noticeable that the two rather coarse ones on the 1st thoracic, which we have referred to in examining

former larvæ (they do not appear to be developed on all), are now replaced by two very long inconceivably fine hairs pointing forwards (fig. ivb).

I have to express my thanks to all those who have helped me in this investigation, especially Dr. Hodgson and Mr. Grosvenor, for material and information, and Mr. Prout for references upon the abstruse points touched upon.

EXPLANATION OF PLATE X.

NEMORIA VIRIDATA.

- | | | | |
|------|----------------------|-----|-----------------------------------------|
| I. | The egg | (a) | Enlarged portion of empty shell. |
| II. | Larva just hatched | (a) | Vertical view of head. |
| | | (b) | 1st abdominal segment. |
| | | (c) | Clubbed hairs. |
| | | (d) | Tactile hair on 6th abdominal. |
| | | (e) | Clubbed hairs on lateral flange. |
| | | (f) | Tactile hair on 2nd thoracic. |
| | | (g) | Two tactile hairs on 1st thoracic. |
| III. | Larva second instar? | (a) | The 1st abdominal segment. |
| IV. | Larva last instar? | (a) | The 1st abdominal segment. |
| | | (b) | Two fine tactile hairs on 1st thoracic. |
| | | (c) | The spicules. |
| | | (d) | The transparent plates. |

The Lepidoptera of Ticino—The Piottino Gorge.

By J. W. TUTT, F.E.S.

Our luck is out! So I thought next morning, August 5th, at about 5 a.m., as I turned out to go on setting. The lovely blue sky of the preceding day was covered with grey, the morning was still, and rain looked imminent. A good chance to clear up I tried to say cheerfully to myself—but my other thoughts belied the cheerful thought. However, I plodded on until 8 a.m., and then went to breakfast. Looking out I saw *Leucoma salicis* busy round the poplars in the road, but the sky was too dull to expect much of a clearance to-day, so I went back and plodded on with the setting until 10 a.m. The streets near the station are planted with planes and poplars, which I could see from my window, and the latter formed the home of a vast number of *Leucoma salicis*, of which the salivary-looking newly-laid egg-masses lay on the leaves, the almost full-grown larvæ resting stretched on the stems or rolled up in the spun-leaves; a large number of pupæ was noticed in the rather untidy cocoons the larvæ make, whilst on the outside of the recently-vacated cocoons, or on the leaves, was an abundance of newly-emerged imagines, mostly paired, that fell into one's hand, if disturbed, although sometimes the ♂ flew off, leaving only the ♀ captive. It was astonishing what a large number of eggs were laid on the trunks of the plane-trees, which could not possibly serve for food, and equally remarkable how few of the imagines were attracted to light considering how abundant the imagines were. By 10 a.m., however, my back ached, the glorious catch of the previous day had been overhauled, and reduced to proper proportions, several doubtful beauties stood on one side, and my friend's advice "if it isn't fine, go down the valley and find the fine weather," rang in my ears. Well one must get out when one has a holiday, and I slipped over to the station, found out the time of the next train down the valley, put on my boots,

packed up, and three-quarters of an hour afterwards was running past my collecting-ground of the previous day in the train. On down to Faïdo, and a patch or two of blue was visible in the sky, and, as I had taken a ticket to Faïdo, the capital of the Valle Leventina, with the notion of going on and paying the difference if necessary, I got out on the arrival of the train there and looked around. Hardly had I left the station than the sun peeped out, the blue patches got larger, and by the time my nose was well-directed to the task of walking back to Airolo, I had found a piece of waste ground and netted my first *Loweia* var. *gordius*. Plenty of *Agriades corydon* soon put in an appearance, followed by *Melanargia galathea*, and we were evidently in for a lovely noon. *Erebia goante* was very common, and *Leptosia sinapis*, still the spring form, flew enticingly over the little wall from the road to the bushes beyond, but they were practically over, and an odd second-brood example showed that, at least down to Faïdo, the late spring had delayed some of the early species, whilst examples that had wintered in warm corners had got out pretty well to time. Soon a rough flowery bank was available, and here I was able to bag a few lovely examples of *Loweia* var. *gordius* among other things, including the first ♀s of the outing, although the ♂s were getting worn. About a mile along the road is a ruined building. At the back, a long-since neglected garden leads up into the wild ground beyond. Here thistles of 5 feet or more in height luxuriated, and, as might be expected, butterflies swarmed; *Dryas paphia* chased each other wildly to and fro; *Erebia aethiops*, in most lovely condition, fluttered among the lower herbage, or flew up the slopes among the bushes, *Vanessa io* looked gorgeous on the thistle-heads, and the metallic green of *Callimorpha dominula* shone in the sun. *Epinephele lycaon* was exceptionally abundant, and flew with the crowds of *Melitaea didyma* and *M. athalia*, still of the mountain form, which swarmed here, whilst *Issoria lathonia* basked in the sun, its newly-emerged silver sparkling brilliantly when one hit it at the right angle, as it lifted its wings. The drop of 1400 feet from Piotta was noticeable, for here the two *Melitæas* were in nothing like the glorious condition noted on the preceding day at the higher level, and the ♀s of *M. didyma* observed were largely of the bright orange tint closely resembling that of the ♂, and not of the paler yellow or clay-coloured form that characterised most of the specimens at Piotta. Many other common species occurred, of which record was unfortunately not kept, and soon after noon we moved on again. *Lasiocampa quercus* insisted on obtruding itself upon our notice, and we netted here and there an insect till we came to the marvellous country, leading over the Polmengo Bridge up to Dazio Grande, through which the railway tunnels circulate as the line drops some 600 feet between Dazio and Faïdo. Here is the lovely Piottino Gorge, a gloriously wild alpine spot, influenced by its comparatively low elevation to produce an abundance of flowers among the savage rocks through which the roaring, tearing Ticino has tunnelled its path through the ages. The sun now shone brilliantly, and, on the flowers, the abundance of butterflies fully equalled that at Piotta on the preceding day, but there were no new species. The magnificence of the "coppers" though was beyond everything. *Heodes virgaureae*, the ♀s exceptionally fine, the ♂s frequently with black discoidal spots on the forewings, *Loweia*

gordius, and more important, perhaps, still, several examples of *Rumicia phlaeas*. It was the only time during the holiday that we saw this species other than singly, whilst, of these, only one ♂ tended to develop the darker southern hue, the others being exceptionally bright, and evidently reared under cool conditions. The darkness of the hindwings of the ♀s of both *H. virgaureae* and *L. gordius* was most noticeable, as well as the brilliance of the copper ground colour. I was very pleased, however, to take a few quite nice *Coenonympha* var. *darwiniana*, the ♀s exceptionally good, among a crowd of worn ones, whilst an occasional *Lycaena arion*, still blundered up and down the banks, or made for the thyme-blossom on which *gordius* loves to feed. *Polyommatus icarus*, *Aricia astrarche*, *Agriades corydon*, *Hesperia alveus* and *Anthrocera purpuralis*, were all abundant here, whilst *Augiades sylvanus* and *Adopaea flava* were both going over. Now and again a full-coloured *Setina aurita* fluttered over from the rocks above, the marginal spots particularly well marked, and this, with the species already noted as occurring below, and *Argynnis niobe* and *A. aglaia*, was about all, except that *Melitaea dictynna* was also taken, but was not in the best condition. We left the gorge at about 1.30. p.m. with a box well stocked, and wondered what the rest of the journey had in store for us, but, though we fished out a large ♀ *Aphomia sociella* from the trough, below the pipe from which we had a drink with our lunch, it was practically the last capture. The gorge opens here suddenly on the wide cultivated valley that leads hence to Piotta, and the ground, at any rate near the main road, produces little or nothing. We tramped most of it in the hot sun, but the upper part of the valley towards Piotta and Airolo was seen still to be in cloud, and, before we reached the former place, we had left the sun behind. We passed the banks that had seethed with insect life the preceding afternoon, and, but for an occasional *Melitaea didyma* or *Parnassius apollo* that could be spotted resting beneath a flower, and a few *Erebia aethiops* and *Argynnis aglaia* that flew almost moth-like in the warm, still, but dull, afternoon, there was nothing much on the move, nor was there scarcely a sign to show what might be there on the right day at the proper time of the year. But we had already much work to do and did not stay, and, though it had not rained when we reached Airolo, we learned that there had been no sun, and that we had done the right thing in going to find it. But rain was in the air, and, next morning, the 6th, it was steadily descending when I looked out as usual about 5 a.m. ready to commence work. Setting, however, was postponed till later that day. I went back to bed till breakfast-time, and the pitiless rain poured and poured till night came. The setting was finished, and at last I could breathe, look round, and feel aggrieved that there was nothing to be done. Next morning it still rained, and this gave the opportunity of raking over the brain-muddle of the busy days, and sifting out the items that we hoped to tell our friends some day. At noon, it looked brighter, and about 2.30 p.m. the weather broke again, the sun came out, and in a very few minutes we were on the road to Piotta for a breath of fresh air after the enforced confinement for nearly two days. How soon butterflies do cheer up after the worst of weather. Long before reaching our favourite banks, the butterflies had crept up from their hiding-places. They were not flying, but each

one was seated on a flower-head, its wings spread horizontally but drawn back, and turned so as to get a maximum of the sun's warmth: almost all the larger butterflies of the banks were there, and almost all were resting in the same manner—*Parnassius apollo*, *Melanargia galathea*, *Erebia aethiops*, *Melitaea didyma*, *M. athalia*, *Heodes virgaureae*, a single worn ♀ *Chrysophanus hippothoe*, *Argynnis aglaia*, *A. niobe*, and many others. The blues, however, sat bolt upright, the wings face to face, the forewings well forward, and somewhat conspicuous, at least *Lycaena arion* and *Agriades corydon* were so. *Anthrocera ochsenheimeri*, *A. transalpina*, *A. carniolica* and *A. purpuralis* looked as fresh as if just emerged, whilst *Adopaea flava* and the first *Urbicula comma* were on the wing. Where do butterflies hide in wet weather so safely? For some 40 hours the rain had come down continuously, and yet, within an hour, the whole of the butterfly fauna of the bankside were sunning, and in as fine condition as if there were no such thing as "weather." The interesting item of the afternoon, however, was a chance observation. A level flat, set back from the road, covered with a number of low flowering plants—yarrow, knapweed, *Lotus*, bugloss, *Euphorbia*, and *Hieracia*—was the scene of the gambols of a number of little gnat-like sprites that flew up and down in the afternoon sun, rarely resting on the blossoms, and that continued their dancing as soon as they had rested. One sweep of the net brought in almost a dozen of the males of the beautiful *Nemotois dumeriliellus*, Dup., with purple apices to its forewings, green bases and golden fascia, and purplish-grey hindwings, the first time I had ever seen this lovely species so exceptionally active.

Some notes on *Brenthis amathusia*, Esp.

By M. GILLMER.

The female of *Brenthis amathusia* lays her large grey eggs on *Viola silvatica*, mostly hidden on dry stalks and leaves near the ground, but sometimes placed even on the ground itself. The upper- or underside of green leaves are rarely chosen on which to lay even a single egg. The larvæ hatch nine or ten days after the eggs are laid, and immediately search out a good hybernating place, e.g., a dry rolled-up leaf, etc. They do not feed at all, but become lethargic, as soon as they have settled in their hybernacula.

This is the customary habit of the larva, and it seems to be founded on an ancient and inherent habit, yet it is possible for this habit to be broken through. If, when the first shoots of potted violet (*Viola silvatica*) have developed somewhat, the plants be put into a cold place till the end of June, and then be incited to make further growth under the influence of a high temperature, the newly-hatched larvæ of *B. amathusia* will occasionally attack the young tender leaves of the plant, and may be reared to a length of one centimetre. Yet, no one appears to have ever succeeded in hybernating larvæ that have thus commenced to feed; evidently other conditions are not favourable to successful hybernation at this stage.

It seems that, in their early stadia, the larvæ of the Argynnids need absolutely young leaves of their foodplant, even in the case of those species which are double-brooded (e.g., *Brenthis selene*, *B. euphrosyne*, *B. dia*). The larvæ resulting from the eggs of the first brood still

find newly-formed leaves on the early shoots of their foodplant at the end of May and beginning of June, and they feed rapidly whilst the young leaves are available. The larvæ resulting from the eggs of the second-brood and those of the single-brooded species, however, do not find young leaves in August, and, probably for this reason, they go into hybernation in dry leaves and such like hiding-places at once (e.g., *Dryas paphia*, *Brenthis amathusia*), or the larvæ hybernate in the egg-shell (e.g., *Argynnis adippe*, *A. niobe*). Old leaves are never used for food.

In recording the foodplants of particular species of Argynnids, much greater care should be paid to the special violet species that is really used for food. Not all violet species are used by the different Argynnid species with the same pleasure, e.g., *Brenthis amathusia* will not eat *Viola mirabilis*, but only *V. silvatica*: a brood of *Brenthis dia* would not eat *V. mirabilis*: *Argynnis adippe* taken wild refused *V. hirta*. The last-named species of violet is also despised by other Argynnid larvæ.

The Life-history of *Lampides boeticus*, Linn.

By (REV.) F. E. LOWE, M.A., F.E.S.

We suppose that hundreds of entomologists are full of gratitude to Mr. Tutt for his *Natural History of British Butterflies*, and look forward eagerly to the frequent instalments which issue with such astonishing rapidity from his fertile pen, though it is to be feared that there are still some collectors who are not yet alive to the absolute necessity of providing themselves with this great work, and mastering its chief contents, if they desire to be, in any real sense, serious students of entomology. Sometimes, undoubtedly it will lead them beyond their present capacity to digest the food prepared for them. But those collectors, and we speak from experience, who live at a distance from the "Hub of the Universe," and cannot enjoy frequent and intimate consultations with their "brothers of the net," or obtain, almost next door, the opinion and assistance of our specialists, will find here all that is known, or wisely surmised, of each genus and species, as it is exhaustively dealt with by the author. We most of us have some one family or species of butterflies which chance or predilection has made our special favourite. Sometimes it happens that this peculiar interest arises from circumstances having thrown in our way an unique opportunity of observing the habits of a little-known insect. Mr. Tutt's book should teach many of us how grievously we have neglected our opportunity, and show us how to make better use of our eyes and note-book if chance favours us again. In our own case, these wise reflections have reference to *Lampides boeticus*, and admiration for the amount of information that Mr. Tutt has now put at the disposal of students. In the year of the great immigration of this species into the Channel Islands, 1899, having had the exceptional experience of seeing this species abundant in our own garden, it was natural to hunt up all available information as to its habits. The result was most disappointing, practically *nil*. English authors knew nothing about it. Far from libraries, the writings of continental naturalists were unattainable, and had they been, the result would not have proved more satisfactory. How different would

be our position in a similar case to-day, with the *Natural History of British Butterflies their World-wide Variation and Geographical Distribution* to hand! It was, as might be expected, with keen avidity that we read, when it appeared, all that the *magnum opus* had to tell us about this species, and it is a subject for marvel, as well as congratulation, that so much information has not only been compiled, but is actually new, within ten years. We have also now excellent illustrations of the egg, pupa, and newly-emerged imago (pl. xix., figs. 1-3). It is pleasant to know our old friend *boeticus* by its old name still. We thank Mr. Tutt for this, and to learn that it, and perhaps it alone, has any ancestral right among its Palæ-arctic relations, to the generic name of *Lampides*. Recent changes in nomenclature have been so bewildering and frequent that it is customary to hear men who desire to be understood, express themselves somewhat in this way, "I mean the little beast we used to call *aegeon*." Perhaps it is with a conscientious desire to maintain some permanent scientific landmarks, that in another excellent recent publication the author has retained such fantastic names as "*The bright-line brown eye*" and "*The brown-line bright eye*," etc.! The life-history of *Lampides boeticus*, however, is worked out thoroughly and systematically, besides cataloguing any changes it may have experienced in names and titles. Sexual dimorphism and variation are fully treated. A useful tabulation of the variation in the females of the British Museum collection has been drawn up. Interesting details of the wide range of difference in size of individual specimens tend to disprove the existence of a separate seasonal form, *aestiva*, Zell. The method of oviposition, with the variety of plants selected by the female, is full of instruction as treated here. The ovum is minutely described, and compared with that of *Raywardia (Langia) telicanus*, with habits and description of larva and pupa, the two last-named almost entirely from the results of recent observations, whilst the plates of the remarkable calyciform hairs of the larva (pl. xx) as well as the comparison of the types of Theclid and Lycænid hairs (pl. xxi) are interesting. The wonderful ear-like structure that covers in the prothoracic spiracle of the pupa is beautifully figured (pl. xxii., fig. 2) as also is an abdominal spiracle and its attendant lenticles (fig. 1). About the method of pupation there appears to be still some disagreement, but it would seem to be quite certain from observations made in Guernsey that, when *L. boeticus* feeds on *Colutea*, it does not pupate in the pods. The hole through which the insect has made its exit is plainly visible (we think as a larva), and, of large numbers examined, we have never found any trace of the pupa-case within the abandoned cubicle. This was also our opinion from examination of the foodplant at Follatterre, near Martigny, where we have taken the larvæ. The peculiar connection between this species and ants is detailed, and the special glands by which and to which the ants are attracted are described in detail, the honey-gland being shown in pl. xx., fig. 2. Of the reputed British captures, Mr. Tutt gives the evidence, and leaves his readers to judge for themselves as to which are worthy of credence. Lastly, the astonishingly wide distribution of this interesting butterfly is traced through Africa, Australia, South and Central Europe, Asia, East Indies, and the Pacific Islands, noting where it is a native, and where an immigrant only. But enough has been said to

show what a fund of new materials for the study of one species is afforded by the *Natural History of British Butterflies*, and what is true of *L. boeticus* is equally true of the vast and comprehensive store of details Mr. Tutt has provided in every page of his unrivalled book.

The generic name *Botys*, Latr.

By LOUIS B. PROUT, F.E.S.

We have long been threatened with a transference of the above name to the *Geometrides* (*vide* Moore, *Lep. Ceyl.*, iii., p. 304, footnote; Kirby, *Handb.*, v., p. 233; Meyrick, *Trans. Ent. Soc. Lond.*, 1892, p. 78), and it became necessary for me, in the course of my researches, to investigate its history thoroughly. The original description reads as follows:—

BOTYS, Latr., "*Hist. Nat.*," iii., p. 414 (1802).—Quatres palpes distincts, dont deux plus petits, appliqués sur les autres. Antennes ciliées ou simples. Une trompe. Ailes horizontales ou légèrement inclinées, formant avec le corps un triangle presque isocèle. Pattes postérieures longues, toujours très-épineuses. Species cited—*erigatus* (= *angustalis*, Schiff.), *colonus* (= *sociella*, Linn.), *purpuraria* (? = *purpuralis*, Linn.), and *potamogata* (= *nymphaeata*, Linn.).

The following is the further important bibliography briefly summarised:—

1803. Latr., "*Dét. Nouv. Dict. Hist. Nat.*," vi., p. 471; cites same four species.

1804. Latr., *ibid.*, xxiv., p. 200; cites only *erigatus* and *purpuraria*.

1805. Latr., "*Hist. Nat.*," xiv., p. 250; cites *purpuraria* and *potamogata*. But on page 224 he has also *purpuraria* under *Phalaena* [= *Geometra*], so that he clearly does not know the species well.

1809. Latr., "*Gen. Crust. et Ins.*," iv., p. 229; gives 10 species, including *purpuraria*, *potamogata*, and (doubtfully—"congener videtur") *erigatus*, but not *colonus*; diagnoses the larva as "sexdecimpoda."

1810. Latr., "*Consid. Gén.*," p. 441; specifies *purpuraria*, Fb., and *potamogata*, Fb., as types of the genus.

1816. Latr., "*Nouv. Dict. Hist. Nat.*," iv., pp. 232-4; describes *potamogata* and others under *Botys*, and briefly alludes to "*purpuralis*, Linn.," etc., as further examples of the genus.

1816. Lam., "*Hist. Nat.*," iii., p. 556; cites *purpuraria* as type of genus.

1817. Latr., "*Règne Anim.*," iii., pp. 572-3; gives 8 species, including only *potamogata* of his original list.

1819. Sam., "*Ent. Comp.*," p. 255; cites only *purpuraria*.

1824. Zinck., "*Ersch and Gruber*," xii., p. 103; cites *purpuraria* and *potamogata* of Latreille's original species, but points out that the former cannot belong to the genus as characterised.

1825. Latr., "*Fam. Nat.*," p. 478; gives, under Section I of "*Crambites*," 4 genera, which are latinised in Berthold's translation, thus:—

1827. Berthold, "*Latr. Nat. Fam.*," p. 485; *Botys* (nom. nud.); *Hydrocampus* (nom. nud., except for citation of *potamogata* as type); *Aglossa* (nom. nud.); and *Ilithya* (nom. nud., except for citation of *colonus* as type).

1829. Latr., "*Règne Anim.*," nouv. ed., v., p. 418; describes only *urticata* and *verticalis* [*ruralis*] under *Botys*, adding other mere names, inclusive of "*purpuraria* of Fb.," in a footnote.

1829. Steph., "*Cat. Brit. Ins.*," ii., p. 164; restricts to *urticata*.

1830. Curt., "*Brit. Ent.*," vii., fol. 312; says the type is the Geometer, *Phalaena purpuraria*, Linn.

1831. Dup., "*Hist. Nat.*," viii., pt. 2, p. 10; gives type *urticalis*.

1834. Steph., "*Ill. Haust.*," iv., p. 46, footnote; criticises Curtis, stating that the type, as established by Latreille in 1802, is *erigatus* (= *angustalis*), and that "Mr. Curtis would have detected this had he followed the principles laid down by himself . . . by reading the characters instead of merely looking at the names of the species;" further states that *purpuraria* was given by Latreille through a *lapsus calami* for *purpuralis*.

Although Stephens does not notice it, Latreille's citation of the name as *purpuralis* in 1816 perhaps helps to confirm this last suggestion; but, in any case, the original diagnosis suffices to bar *Lythria purpuraria* as a possible type. Moreover, his diagnosis of 1809 includes a definite mention of sixteen legs for the larva. It is clear that an absolutely mechanical chronological restriction would make the type *erigatus* (= *angustalis*), the only possible one mentioned in 1804, and the first one on his original list; nor would his hesitancy in 1809 be fatal, as *erigatus* would already be fixed, and it is impossible to tie him down to a type concerning which he never vacillated—in 1825, *potamogata* went to *Hydrocampus*, and *colonus* to *Ilithya*! It seems, then, that the right course is to follow Stephens in declaring *Cledeobia angustalis*, Schiff., to be the type of the genus; in any case, I shall absolutely reject it from the *Geometrides*.

The Genus *Gampsocleis*, Fieber.*

By MALCOLM BURR, B.A., F.E.S., F.Z.S., ETC.

A. M. Shuguroff, of Kutais, has published a preliminary synopsis of the Eurasian species of the genus *Gampsocleis*, Fieber. As the article in question appears in the Russian language, in a provincial Russian journal, it is perhaps worth while noticing it in some detail. The full title is "Predvaritel'nui Obzor Evraziatskih Vidov Roda *Gampsocleis*, Fieb. (Orthoptera, Phasgonurodea, Decticiidæ)": the title is also given in Latin, as follows:—"Synopsis præcursoria specierum Eurasiaticarum generis *Gampsocleis*, Fieb. (Orthoptera, Phasgonurodea, Decticiidæ)."

The name *Gampsocleis* is misspelt (*Campsocleis* in both places on the title-page, and "Fieb." is misspelt as "Fied." though the orthography is correct in the text.

It is reprinted from the "Zapiski Novorossiskago Obschestva Estestvoznania," that is, the "Memoires of the Novorussian Natural History Society, vol. xxxi., 1907 (separated pagination), published at Odessa.

After a brief preface, in which the Latin names are frequently misspelt, there is a synoptical table of the four species known to occur in Russia, namely, *G. spinulosa*, Kr., *G. podolica*, Shug., *G. annae*, Shug., and *G. glabra*, Herbst, in Russian, and then in Latin.

The tables are followed by a brief diagnosis of each species with synonymy and distribution. The two new species, *G. podolica* (from Podolia) and *G. annae* (from North Central Caucasus) are briefly described.

There follows a list of the ten species known, as follows: *G. glabra*, Herbst, and its Spanish var. *assoii*, Bol., *G. abbreviata*, Herm. (Balkans); *G. reticauda*, Werner (Asia Minor); *G. spinulosa*, Kr. (Hoang-Ho and Irkutsk); *G. podolica*, Shug. (Podolia); *G. annae*, Shug. (Caucasus);

* "Predvaritel'nui Obzor Evraziatskih Roda *Campsocleis* (recte *Gampsocleis*, Fieb.), Fied. (Orthoptera, Phasgonurodea, Decticiidæ)." "Synopsis præcursoria specierum Eurasiaticarum generis *Campsocleis*, Fied. (Orthoptera, Phasgonurodea, Decticiidæ)," by A. M. Shuguroff (Odessa). [From the "Zap. Novoross. Obsch. Estestv.," xxxi., 1907; "Memoires of the Novorussian Nat. Hist. Soc.," Separate pagination, pp. 1-133, spp. n. *G. podolica*, Shug. sp. n. (Podolia) (p. 4); *G. annae*, Shug. (North Central Caucasus) (p. 4).]

G. tamerlana, Burr (Mongolia); *G. obscura*, Walker (= *gratiosa*, Brunner) (Korea and China); *G. micado* (recte *mikado*), Burr (Japan); *G. buergeri*, Haan (= *mutsohito*, Burr) (Japan).

After a few remarks on the geographical distribution, there follows a synoptical table of these ten species known from the Eurasian continent, first in Russian and then in Latin. The article is closed by a list of works referred to. As a brief synopsis of a most interesting genus, it is a useful contribution to our knowledge of the *Decticiidae*.

Dysstroma concinnata, Steph., a valid species.

By LOUIS B. PROUT, F.E.S.

In my recent investigations of the genus (I know our editor will not allow me to say "subgenus") *Dysstroma*, Hüb. = *Polyphasia*, Steph., I have discovered that the so-called "*Arran truncata*" fulfils all the requirements of a valid species. By the kind help of Mr. W. Smith, of Paisley, in supplying me with material and notes, and of Mr. F. N. Pierce, in examining the genitalia, I have been able to get some light on the *Arran* forms, and, although details may be reserved until the publication of a paper which I have recently read before the City of London Entomological Society, it seems desirable to put on record at once that, whereas typical *D. truncata* and typical *D. immanata* from *Arran* agree entirely in their genitalia with those from other parts, four *D. concinnata* (constant *inter se*) show a difference of structure, the spines on the ædæagus being intermediate between those of the other allies, or nearer to those of *D. immanata*. Of course it has long been known that the race is quite constant, and, therefore, certainly breeds true. The synonymy of the species is as follows:—*Polyphasia concinnata*, Steph. [*Cat. Brit. Ins.*, ii., p. 134, *nom. nud.*], *Ill. Haust.*, iii., p. 229. *Electra boreata*, Curt. [*Guide*, col. 163, *nom. nud.*], *Brit. Ent.*, xiii., fol. 603. *Polyphasia russata* var. *concinnata*, Westw., *Brit. Moths*, ii., p. 38. [*Cidaria*] *russata* var. *consolidata*, Gregs., *Young Nat.*, vi., p. 254 (*nom. nud.*?).

Preoccupied Generic Names.

By J. W. TUTT, F.E.S.

It is said that only those who do nothing make no mistakes. It appears to me that one has only to do a little to make a good many. In *The Natural History of British Butterflies*, vols. i and ii, it has been necessary to create many new generic names. Among these, three are preoccupied, and have to be renamed. They are as follows:—

(1) *LEECHIA*, *Nat. Hist. Brit. Butts.*, ii., p. 142 (type *thalia*), is preoccupied, see *LEECHIA*, South, *Trans. Ent. Soc. Lond.*, 1901, p. 400. *LEECHIA*, Tutt (type *thalia*), is, therefore, renamed *STRYMONIDIA* (type *thalia*), see *Nat. Hist. Brit. Butts.*, ii., p. 483.

(2) *EDWARDSIA*, *Nat. Hist. Brit. Butts.*, ii., p. 142 (type *w-album*), is preoccupied, see *EDWARDSIA*, Quatrefages (1842). *EDWARDSIA*, Tutt (type *w-album*) is, therefore, renamed *CHATTENDENIA* (type *w-album*), see *Nat. Hist. Brit. Butts.*, ii., p. 483.

(3) *LANGIA*, *Nat. Hist. Brit. Butts.*, i., p. 314 (type *telicanus*) is preoccupied, see *LANGIA*, Moore, *Proc. Zool. Soc. Lond.*, 1872, p. 567. *LANGIA*, Tutt (type *telicanus*) is, therefore, renamed *RAYWARDIA* (type *telicanus*), see *Nat. Hist. Brit. Butts.*, ii., p. 484.

There is really no *bona fide* excuse for any of these names being overlooked, except the unfortunate necessity of going the pace of the "highly civilised" twentieth century, which leaves "no time for nuffin'."

VARIATION.

THE GEOGRAPHICAL BEARING ON THE VARIATION IN SIZE OF *POLOMATUS ICARUS*.—I have often been struck, in looking at my series of *P. icarus*, by the larger size of the insects from the north than those from the south, and have wondered whether this is constant. It may be that I have selected the largest and finest specimens, but, as I have collected all my southern ones myself from Folkestone and Devonshire, I should do the same with them. North-west Lancashire, near Grange-over-Sands, produces a fine race fully as large as those I have from Ireland, and from the west of Scotland I have similar forms. Both the ♂ and ♀ from Grange are as large as the Irish, but the ♀ is not quite so blue, but the ♀s from Scotland are not quite equal in size to the Irish forms. I do not know if this is likely to be of any interest to others, but there is no harm in comparing notes.—HERBERT MASSEY, F.E.S., Ivy Lea, Burnage, Didsbury. May 18th, 1908. [The point raised by Mr. Massey is an interesting one, and applies in a general sense to other species belonging to other groups. We have hitherto explained it to our own satisfaction by supposing that it is largely due to a longer larval existence, added to the condition of the food-supply, the conclusion being based on the fact that where a species is single-brooded it often gives larger examples than where double-brooded, and that, when double-brooded, the brood that has the longer-feeding larvæ gives the larger specimens, *e.g.*, the first brood of *Melitaea phoebe* (larvæ August to May) is larger than the second (larvæ June and July) in Savoy and Piedmont, and the single-brooded specimens in the Swiss Alps (larvæ July to June) larger than either. Similarly, the second-brood of *Scolitantides orion* has nearly double the wing-area (larvæ April to July) of the spring emergence (larvæ September to October) in Piedmont. Many cases of larvæ living from August to May and then producing a larger first-brood, whilst the larvæ from June to July produce a smaller-sized second-brood, must be known to all lepidopterists.—ED.]

NOTES ON COLLECTING, Etc.

EUPITHECIA TAMARISCIATA.—I am much obliged to our Editor for his note (*antea*, pp. 102-4) on his investigations, and have great pleasure in withdrawing the suggestion that his previous article was "perhaps a little premature" (inadvertently amplified by Mr. Tutt on p. 102 into an assertion that it "was premature")—a suggestion which was certainly not intended to give any offence. I do not wish to embroil Mr. Holmes, and will only say that, between him and myself, the extent of the work that Mr. Tutt had put into the subject was misapprehended. Possibly his own words, that he had "little difficulty" in referring Mr. Holmes' specimens, aided the illusion. For the sake of readers who are unacquainted with *E. tamarisciata*, I may say that it is usually darker than *E. innotata*, the average size perhaps smaller (though *E. innotata* is variable both in size and colour), and that

Staudinger considers it only distinguished from *E. fraxinata* by the foodplant of the larva.—LOUIS B. PROUT. May 18th, 1908.

HELLINSIA CARPHODACTYLA AT SANDOWN.—It is interesting to note the capture of *Hellinsia carphodactyla* in the Isle of Wight (*antea*, p. 18). I suspect that it will be found in many localities in the south where the foodplant grows, although, from my knowledge of its retiring habits as an imago, I am not surprised at its being so long overlooked. The two specimens mentioned by Mr. Prout were evidently illustrative of the two broods—the larger, pale, lemon-coloured form being the June brood, which is still to be found in many British collections under the name of *H. osteodactyla*, while the small August brood bears an even greater superficial resemblance to *Adaina microdactyla* than to the early brood of its own species.—J. OVENDEN, Frindsbury Road, Strood, Kent. May 16th, 1908.

HEMEROPHILA ABRUPTARIA, GRACILARIA SYRINGELLA, ETC., AT LEWISHAM.—The fine weather that came in with May soon brought insects as well as vegetation out, and with apple in blossom almost at the same time as plum, cherry, and pear, and lilac and laburnum together within a week of these, it is no wonder that hibernating larvæ began to move, and the moths already overdue commenced to appear. On May 9th, the first *Hemerophila abruptaria* was seen, getting gradually more abundant, until now there are several to be seen daily, sitting with their wings well spread on one batten of an oak fence, whilst their heads are pressed against the next overlapping batten, the costa of the forewings drawn rather further back than the front of the thorax, and looking just like a pale broken patch on the fence. A large percentage seen appear to be ♀s. Already, too, *Gracilaria syringella* is on the wing in numbers in the garden, strangely enough, flying about elder, though no doubt the privet leaves will show that their visits have not been confined to the former plant; but why does elder attract them? *Abraxas grossulariata* larvæ are not common in the garden on currant, although abundant enough in neighbouring ones on *Euonymus*.—A. M. COCHRANE. Lewisham. May 18th, 1908.

THE RE-AWAKENING OF HYBERNATING LARVÆ OF APORIA CRATÆGI AND LEUCOMA SALICIS.—Larvæ of *Aporia crataegi*, hibernated in the garden, began to crawl out through a hole in the muslin sleeve and sun on the outside, without eating, during the last week in April. They are now steadily feeding, however, although very small. Within a day or two of the same time, tiny larvæ of *Leucoma salicis* left their strange little winter nests, in a sleeve on a poplar, and commenced to gnaw off the soft tissue of the newly-formed leaves; they have done a good deal of eating since, but are still very tiny. It seems late to find neither of these species commencing to feed at all until the beginning of May.—A. M. COCHRANE. May 18th, 1908.

WILD PAIRING OF DIMORPHA VERSICOLORA AT READING.—I have again been successful in obtaining a wild pairing of *Dimorpha versicolora*, making thirteen years in succession. I obtained it this year on April 29th, my latest previous date was April 17th, 1904, my earliest date, March 20th, 1897. I have heard of no one else obtaining a pairing this year in this district. On April 17th, I took four ♀s; it was a perfect day, and I had them on the bushes from 11 a.m. until 4 p.m., but did not see a ♂, so I do not think they could have been out in the wild; then the weather turned very cold again; I tried again on the

20th, but there were snow-storms all day. On the 29th, the day I succeeded, I had to ride my bicycle through about half a mile of water, as the roads were flooded; I took five ♀s, but only saw one ♂, and that in fine condition.—W. E. BUTLER, F.E.S., Hayling House, Oxford Road, Reading. May 3rd, 1908.

LARVÆ OF ODONTOPERA BIDENTATA DAMAGING FOLIAGE AT SOUTH SHIELDS.—In early September, in this district, the ivy is badly eaten by a large Geometrid larva; it disfigures badly the plants in the Marine Parks, and appears also to attack *Euonymus japonicus* and *Ilex shepherdi*. The damage was first noticed in 1904, and has been observed every year since. Some larvæ collected last September pupated in due course, and have produced, during the past month, typically coloured specimens of *Odontopera* (*Gonodontis*) *bidentata* (April 10th to May 18th). As an insecticide, I find that "paraffin emulsion" is of very little use, possibly "Paris Green" or "London purple" would be more effective.—WILLIAM BENNETT, Marine Parks, South Shields. May 20th, 1908.

CURRENT NOTES.

Mr. Edwards (*Ent. Mo. Mag.*, notes *Dryops* (*Parnus*) *luridus*, Er., as common locally in Norfolk—Horning, etc.; Dr. Joy, that *Notiophilus pusillus*, Wat. (*bigeminus*, Thoms.), and *N. hypocrita*, Spaeth, are mixed up in British collections with *N. aquaticus*, L., and *N. palustris*, Duft; whilst Mr. Newbery adds *Micrambe villosa*, Heer (*pilosula*, Er.), on the strength of one specimen, beaten off hawthorn-flowers in June, 1895, at Chingford, Essex, to the British fauna.

The British lepidopterist is progressing. It is now twenty years ago since we separated *Hydroecia nictitans*, L., *H. lucens*, Fr., and *H. paludis*, Tutt, and described the variation of the different forms (*Brit. Noct. and their Varieties*, i., pp. 58-65). Occasionally there has been a half-hearted recognition of the fact by some lepidopterist who has been puzzled by *H. paludis* when he has really discovered it among his captures. Now we find that the Rev. C. R. N. Burrows has exhibited the ancillary appendages of these species at a recent meeting of the City of London Entomological Society, and finds them absolutely distinct. Following this, the Lancashire and Cheshire Entomological Society devoted the greater part of its meeting, held on April 13th, to an exhibition of these three species, at which a discussion was opened by Mr. F. N. Pierce, who showed preparations of the genitalia under the microscope (as well as those of a possible fourth species, first indicated by Mr. Burrows), and demonstrated that the ancillary appendages are markedly different, and fully support the view that we have really four species in this little group, three of which, at least, were correctly differentiated twenty years ago. For the fourth species the name *crinanensis* has been suggested, the examples having been taken by Messrs. Bacot and Simes on the banks of the Crinan Canal.

Mr. Rollason adds another to the "lifehistories" (!) of *Cyclopides palaemon*, which he publishes as being more detailed than those of Hellins, Buckler, and Frohawk. Mr. Frohawk complains of this (*Ent.*, p. 154) and states that his was the first complete life-history of *H. palaemon* and "remains so," adding that Mr. Rollason's descrip-

tions are "unnecessarily lengthy," etc., etc. This is very funny. As a matter of detail Mr. Rollason's account looks small ($4\frac{1}{2}$ pages of general descriptive matter against the 25 pages of the account in the *Nat. Hist. of Brit. Lepidoptera*, i., pp. 190-215), and the description of the egg "shining pearly of a warm whitish-grey colour" hardly bears comparison with the illustrated article (*Ent. Rec.*, xx., pp. 14 *et seq.*) on the same subject. Mr. Frohawk complains that Mr. Rollason does not refer to the larval moults, but then neither Mr. Frohawk's nor Mr. Rollason's larvæ seem to have tubercles and other structures considered important nowadays. Besides, what constitutes a life-history? How little we know of the life-history of anything.

We do want very badly a really good scientific description of the early stages of *Adopaea flava* (*thauwas*). As is usual, we know least of the commonest species of our British fauna. Eggs, larvæ, or pupæ of any of our British "blues" (except *Celastrina argiolus*) would also still be very acceptable, so would dates of capture, habits, etc., noted by our regular correspondents the last three or four years.

It is with the greatest regret that we have just heard that one of the best known entomologists in France, Pierre Adrien Prosper Finot, Capitaine d'Etat Major Retraite, Chevalier de la Legion d'Honneur, died at his residence at Fontainebleau, on April 14th last, at the age of 70. He was not only one of the best orthopterists in Europe, but a man of most charming personality—affable, kind, and generous—as some of us, who were fortunate in knowing him personally, can testify most fully. A day with him at his collection was full of educational interest, whilst a day in the Forest he knew so well was one of the treats of a lifetime. That you were a lepidopterist mattered little; he knew the localities in the distant parts of the Forest for all the more local species; he guided you to the most secluded corners, and pointed out everything of interest—geological, botanical, zoological—on the way; whilst his knowledge of his favourite order seemed unlimited. His work is of the most solid and trustworthy character, the outcome of long and careful study, and must always take a high place in the consideration of those who, in the future, will have to consult it, or bring its conclusions unto judgment. One of our colleagues promises a full notice in an early number, together with a photograph of the deceased savant.

Mr. Champion reports *Cryptophagus loevendali*, Ganglb., as captured in the New Forest, on July 23rd, 1907.

Mr. A. E. J. Carter adds two diptera to the British list: (1) *Pegomyia esuriens*, Mg., captured July 8th, 1907, at Comrie, Perthshire. (2) *Pegomyia univittata*, v. Ros., a ♂, captured August 8th, 1906, in co. Waterford, by Mr. H. W. Andrews, others taken at Comrie, July 9th, 1907, and yet others July 3rd, 1905, in the New Forest, by Mr. Adams. Mr. Jenkinson describes *Brachypeza radiata*, n. sp., from specimens captured at Cambridge, August 2nd, 1901, July 5th and September 2nd, 1905, August 20th, 21st, 22nd, 1906, and July 27th, 1907.

Mr. Brocklehurst records the capture of an example of *Notodonta tritophus* on May 13th, 1907, at electric light, at Bedford.

Mr. Collin notes the following diptera captured by Mr. Malloch in Dumbartonshire as new to the British list—*Amaurosoma inermis*, Becker, *A. armillata*, Ztt., *Sapromyza quadrivittata*, Lw., *Anthomyza unguicella*, Ztt., and *Diastata inornata*, Lw.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—*May 6th, 1908.*—**ABERRANT TEPHROSIA CONSONARIA.**—An example of the melanic ab. *nigra* of *Tephrosia consonaria* bred from a wild ♀ taken at Watlington, near Maidstone, by Mr. W. Goodwin. **LARVA OF ÆGERIA ANDRENIFORMIS.**—A living larva of *Ægeria andreniformis* feeding in the stem of *Viburnum lantana*, Mr. A. H. Jones. **INSECTS IN AMBER.**—A number of specimens of insects in amber apparently of great geological age, showing several forms closely allied to those of existing insects; one orthopteron being very near to *Ectobia lapponica*, Mr. R. Shelford. **A LIVING BLATTA.**—A living example of *Blatta* found in bananas from Mexico, which Mr. Shelford said he thought was *Panchlora nivea*, Linn., Mr. C. Waterhouse. **NUDARIA SENEX AND CALLIGENIA MINIATA.**—A living larva of *Nudaria senex*, and living larva and pupa of *Calligenia miniata*, attention being drawn to the incurved and most curious clubbed bristles of the former, and also to the hair-tufts on the 5th segment of the latter as being much darker than on the remaining segments, Mr. H. M. Edelsten. **ALBINISM IN EPINEPHELE JURINA.**—A whitish aberration of *Epinephele jurina*, taken by Mrs. Elliot in Holme Park, Sussex, in June, 1904; the wing coloration was practically white, with the fulvous blotches on the anteriors decidedly bright and fulvous, Mr. O. E. Janson. **FOOD OF GLOW-WORM.**—A glow-worm found at Oxshott on May 4th, inside the shell of a snail, *Helix cantiana*; there was no doubt that the larva was feeding on the snail, for, on breaking away parts of the shell the moist remains of it were found near the apex. **TYPE OF OXYGASTRA.**—The ♂, ♀, and nymph, of the dragonfly *Oxygastra curtisii*, first described by the late J. C. Dale, and at that time supposed to be confined to the British Islands, Mr. W. J. Lucas. **NEW BRITISH BEETLE.**—*Xantholinus distans*, Kr., taken at Helton, near Dumfries, on May 1st, 1908, Mr. H. St. J. K. Donisthorpe. **DISTINCTION OF CERTAIN SPECIES OF EVERES, DETERMINED BY THEIR GENITALIA.**—Photographs were exhibited to illustrate the result of investigations showing that *Everes argiades*, Pall., and the so-called var. *coretas* were separate, whilst American examples referred to *E. amyntula* appeared to connect the distinct European forms, Dr. T. A. Chapman.

SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—*April 23rd, 1907.*—**TERATOLOGICAL EXAMPLE OF ARGYNNIS AGLAIA.**—A specimen of *Argynnis aglaia* with the left forewing about half size, but otherwise perfect; it was taken at Eastbourne. **PARASITE ON LARVA OF TORTRIX PRONUBANA.**—A larva of *Tortrix pronubana* with a parasitic larva attached to its undersurface, Mr. R. Adkin. **LYCÆNID LARVÆ.**—Living larvæ of *Polyommatus icarus* and *Plebeius argus (aegon)*, the former quite, and the latter nearly, fullgrown, Dr. T. A. Chapman. **LARVÆ OF ÆGERIA ANDRENIFORMIS, ETC.**—Stems of *Viburnum* containing larvæ of *Ægeria andreniformis*; also larvæ of *Camptogramma fluviala* and *Agrotis ashworthii*, Mr. L. W. Newman. **ALBESCENT LEPIDOPTERA.**—Two Indian Pierids, *Catopsilia catulla* and *Delias eucharis*, with bleached wings, Mr. H. Moore. **MEALWORMS.**—Larva, pupa, and imago of *Tenebrio molitor*, Mr. H. Main. **ABERRATION OF CITRIA FULVAGO.**—Specimens of *Citria fulvago (cerago)* ab. *flarescens* from Forres, Mr. A. Sich.

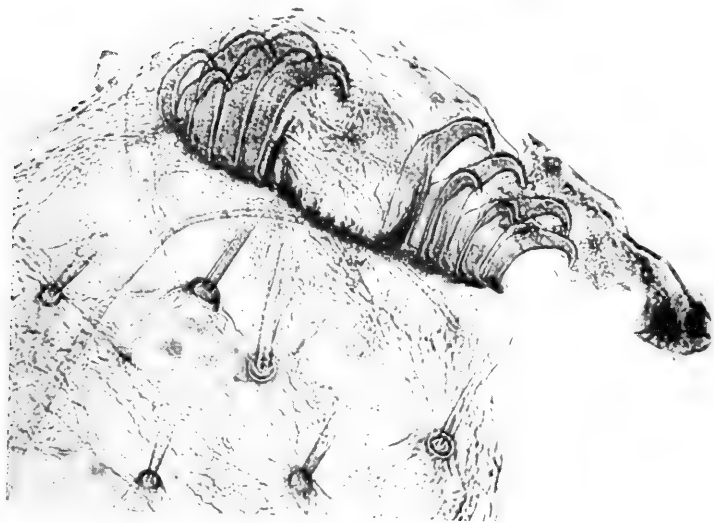


Photo. F. N. Clark.

2

CLEOGENE PELETIERARIA—EGGSHELLS ($\times 30$) AND PROLEG IN PENULTIMATE STAGE ($\times 165$).
The Entomologist's Record, etc., 1908.

1

Photo. A. E. Tonge.

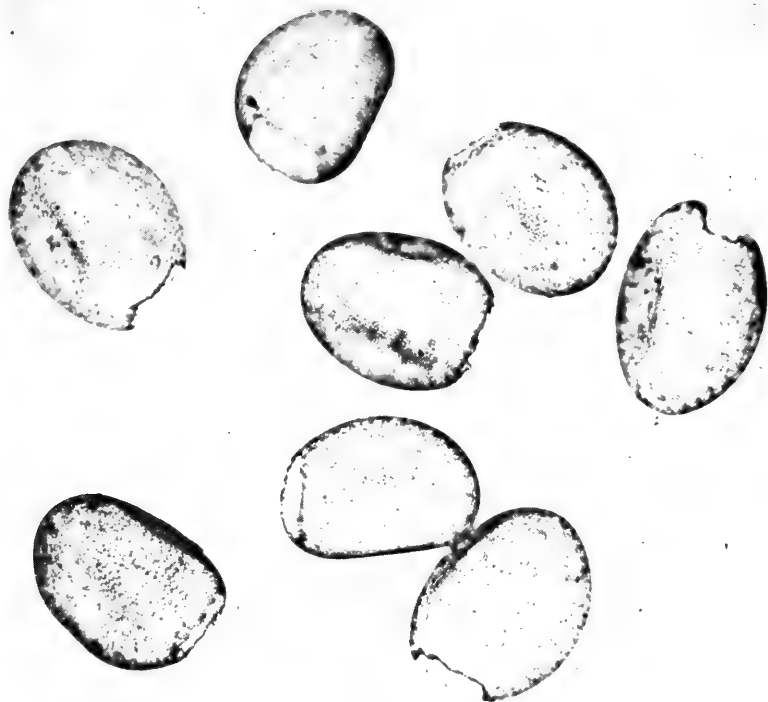




Photo. F. N. Clark.

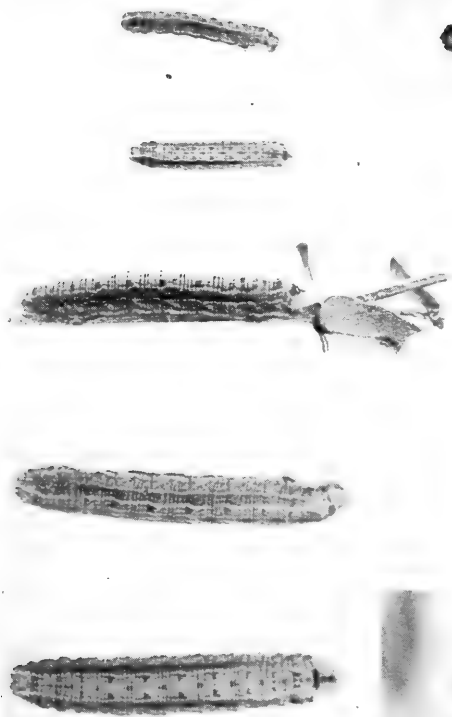
CLEOGENE PELETIERARIA—LEFT HALF OF PROTHORACIC PLATE OF FULL-GROWN
LARVA ($\times 60$).

The Entomologist's Record, etc., 1908.



1 2 3 4
CLEOGENE PELETIERARIA—SKINS OF LARVA 1ST STAGE (1-3) AND 2ND STAGE (4) $\times 15$.
Photo. A. E. Tonge.
The Entomologist's Record, etc., 1908.

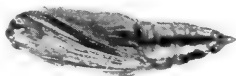
5 4 3 2 1



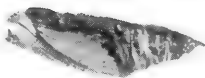
10



9



8



7



CLEOGENE PELETIERARIA—LARVÆ AND PUPE $\times 2\frac{2}{3}$.

6 Photo. A. E. Tonge.

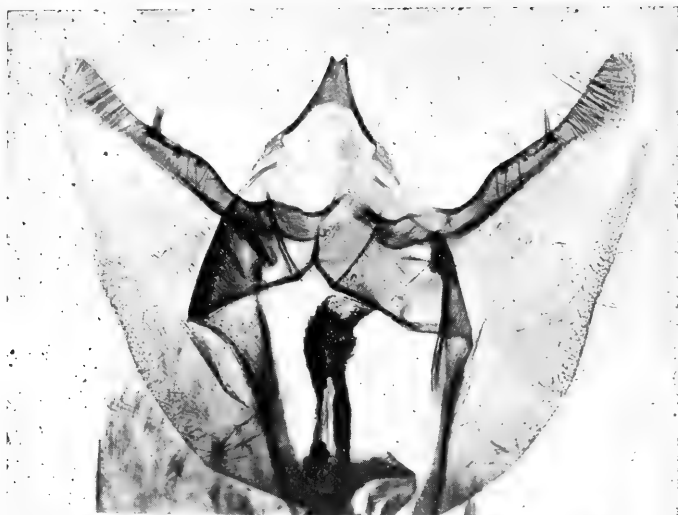




Photo. F. N. Clark

CLEOGENE PELETIERARIA—END OF PUPA ($\times 45$) AND MALE APPENDAGES ($\times 30$).

1.



2.

Photo. F. N. Clark.

ANCILLARY MALE APPENDAGES OF (1) *CLEOGENE LUTEARIA* AND (2) *C. NIVEARIA*
 $\times 30$.

The Lepidoptera of Ticino—Piora.

By J. W. TUTT, F.E.S.

I had already sampled the butterflies of the valley at Piotta, and the slopes at Brugnasco, and I wondered what those distant mountain-tops above the pine-forests of the slopes above Brugnasco and Altanca held in the way of lepidoptera, so, when the morning of August 8th broke, sunny, and with only a few cumulus clouds floating high up across the blue, I thought of the distant mountains, and, by 8 a.m., was on the way to Piora. I had the day before me, and so I did not hurry, but just collected along the Brugnasco slopes without waiting to make a bag of anything. *Parnassius apollo* was in great abundance, and so were *Argynnis aglaia* and *A. niobe*, whilst *Erebia goante*, and *Melitaea athalia* were also very numerous. A number of beautiful *Issoria lathonia* sunned in the pathway with many worn *Brenthis amathusia*, and an occasional *B. euphrosyne* was still to be seen. *Melitaea didyma* was just emerging, a few males only being noticed, whilst a single *Lycæna arion* flew rapidly along the slopes, but pulled up suddenly at a small thyme plant in full blossom, I hoped for egg-laying, although it appeared not, for, when I carefully approached it, it was found to be sucking the nectar from the flowers. *Agriades corydon* was in great abundance at the puddles on the path, as also was *Hesperia alceus*, and a few *Plebeius argus* (*argyrogonon*) were noticed. Some of the *Anthrocera purpuralis* had evidently only just emerged although the greater number were worn, whilst a beautifully fresh *Adscita geryon* was netted as it buzzed over the bank, and two very fair *Coenonympha* var. *darwiniana* were also captured. Over the tall rocks *Setina aurita* fluttered down, mostly spotted, but two with characteristic extended lines, one with the ground colour finely suffused with brown, a really fine ab. *suffusa*, quite parallel with one of *S. irrorella* that I took at Chamonix, and another captured on the Dover Cliffs. What brings about this parallelism in colour variation? What makes these bright orange species occasionally assume such a characteristic form in such widely different localities? A ♂ *Rumicia phlaeas* ab. *suffusa* is very pretty, and one is astonished to see, careering over the slopes, a fine pale ♀ *Colias palaeno*. It doubled back when about 50 yards in front, flew up the slope and down again in excellent style, but it suddenly turned swiftly towards me as it reached the path, and was in the net in a moment. Only another specimen or two was seen during the day, and not another came within yards of being captured. The ♂ *Aporia crataegi* were still in plenty and occasionally a quite nicely-coloured example was to be seen. But progress was the order of the day, and, though a few *Gnophos obfuscata* were disturbed as one advanced through the thick bilberry-carpeted pine-wood, and *Erebia goante* remained constant wherever the sun shone on the rocks, one reached Altanca without any change in the fauna. Beyond Brugnasco one enters this pine-wood, but leaves it again for the open cultivation around Altanca, only to enter it again when the zigzags begin in reality to climb the mountain beyond the latter village. Here the dark pines swarm steeply up the mountain-side, the open glades, brilliant with the usual subalpine flowers, forming splendid retreats for several butterfly species. Crossing the fields then that furnish employment for the Altanca villagers, one reaches these zigzags that defy almost everything but the human foot. Luggage of every

JULY 15TH, 1908.

description is here carried on the head and backs of porters, and terrible work it seems, especially as one feels that, with a little expenditure here and there, the ascent might be made quite possible for luggage mules. But the end of the fields is the real commencement of alpine life. True, numbers of the lower species persist, right up to the top of the Col at about 6000 feet. Such are *Brenthis amathusia* found in every sunny opening in the pine forest, which, first in serried ranks, and later thinly extended, reaches up even above the Col that leads to Lake Ritom and Piora. *Argynnis niobe* and var. *eris* are both more abundant than *A. aglaia*, but the ever-growing presence of *Erebia* is the most marked feature. First *Melampias melampus*, then *Erebia tyndarus* joined *E. goante*, flying up and down the steep flower-covered slopes, over which the zigzags ever-ascended, and walking up which was much like climbing up-stairs, but now on steep sharp-edged rocks, then on soft earth that crumbled under one's foot at every step, owing to the last two or three days of heavy rain. On one such slope *Coenonympha darwiniana* still occurred in some numbers, whilst *Heodes virgaureae*, *Issoria lathonia*, *Brenthis amathusia* and *Agriades corydon* occupied every suitable spot. To the right, as one ascends, is the ceaseless hum of the Fossbach, falling in a series of cascades from its outlet from the lake above. But the climb became too fatiguing for collecting, too exhausting almost to think, and I toiled up the steep zigzags between the edge of the pine-forest and rocks on one side, and the lovely Fossbach on the other, up through the deserted village of Valle, up past the higher cowsheds, and at last reached one of those wild rough places, laid out by a mountain torrent, and then overgrown with plants and flanked by steep flowery banks that are the glory of the entomologist in the high alps. Here *Brenthis pales* was abundant, the ♀s dark, but the species somewhat worn, and here at almost 6000 feet elevation was a splendid mixture of alpine and low-land forms, for, with *Erebia ceto* and *E. mnestra*, *E. euryale*, *E. tyndarus*, *Melampias epiphron*, and *M. melampus*, there were *Heodes virgaureae*, *Brenthis amathusia*, *Anthrocera purpuralis*, and *A. transalpina*, whilst *Melitaea dictynna* and *Brenthis euphrosyne* still held their own. Two more *Adscita geryon* occurred on these slopes, and, as one finished the slippery ascent and reached the path again, one was glad to sit down and rest on a point of vantage where one saw the full beauty of the waterfall before one. The Fossbach poured over the rocks, and then spread itself as the lower rocks terraced themselves beneath. Back again the path turned, but always up, up, and then one suddenly found oneself on level ground, and for a long long distance the upland valley was filled with the beautiful Lake Ritom. The mountain peaks now appeared as small hills of a few hundred feet all round the lake. Here and there footpaths led to the summits of the heights around, and one felt that one was at last quite among the topmost peaks of the mountains that one sees on the horizon to the left as the train glides snake-like down the Ticino valley, or to the right as it groans and pants upwards in its ascent. A well-beaten path runs round the lake, on and on. It was still a half-hour from noon and the hot sun beat on the moist earth that had been for the last two days soaked in the icy cold of the rain-clouds. The walk round the edge of the lake is the memory of a life-time. We have already described (*Nat. Hist. Brit. Butts.*, ii., pp. 327-8) the countless swarms of *Erebia*s, blues and fritillaries that were at

every puddle or oozing rill, whilst *Cotias phicomone* scoured the flower-laden slopes. For an hour we walked round the lake, whilst the sun scorched our faces, and our boxes were filled. Then we lunched by an icy-cold spring, and on again. We calculated whether we ought not to go on through this lovely alpine land, and drop to Disentis, and then go back and find our luggage; but we were getting tired, and the way was long, so we followed the path back again, and rested at Piora, the land of flowers, where one house constitutes the village, and is, in fine weather, a region of loveliness. What it is when the rain-clouds hold it for a week or so at the time, we know not. We caught Piora in its greatest loveliness, and as we left it in the afternoon sunshine, the still lake with hardly a ripple, the patches of snow still on the edge of the pine-woods, and the rushing Fossbach, falling over its rocky terraced bed 100 feet or more into the valley below, we could not help lingering on the Col, and wondering whether it would ever be our happy lot to see this beautiful spot again, isolated among its mountains, surrounded by the grandeur of their pine-covered slopes, nestling among the natural beauties that water and rocks, and flowers bestow. We did not collect as we descended, but we saw the busy natives mowing the steep flower-banks at Brugnasco, and we knew that the entomologist's harvest there had gone for this season at least.

Next morning was again dull and cloudy, and we rested that day, setting our captures and making a few notes. A fortnight of our holiday had passed, and we had much to do. We would leave it to chance. If the next morning should be bright we stayed another day, if not, we moved on to Lugano—chance decreed that we went to Lugano.

Notes on lepidoptera from the Pyrenees—*Cleogene peletieraria* (with seven plates).

By DR. T. A. CHAPMAN.

One of the characteristic species of the Pyrenees is *Cleogene peletieraria*, this species was only known from the Pyrenees until I took it in 1904 in the Cantabrian mountains. Of course, these ranges of northern Spain are continuations of the Pyrenees, and have a good many features in common.

This year I saw *C. peletieraria* flying freely as I went up to the Col du Riou, and on the slopes some miles further north and a little higher, where I found *Erebia gorgone* common, I met with several ♀s of *E. peletieraria* at rest on grass stems, curiously enough, I did not here see one ♂ on the wing. These ♀s laid a large number of eggs, which duly hatched shortly after my return home. The larvæ fed readily on *Lotus corniculatus* and grew rapidly, and a considerable proportion went right ahead, and the moths emerged in October and November. This enabled me to follow the species right through, which might have been difficult had the larvæ hibernated as they do naturally. There are many lepidoptera that are single- or double-brooded, according to circumstances of locality and climate, but *C. peletieraria* inhabits slopes at such an elevation that it is almost certainly always single-brooded (4500ft.-6000ft.). Unquestionably, my moths emerged when their native slopes would be a hopeless place of residence for the imago. I was, therefore, somewhat surprised to

find such a species so readily agree to be forced forwards and produce an autumn emergence.

I have made some complaint of the lumping of certain Erebias, chiefly by Staudinger; in the case of *C. peletieraria* and *C. nivearia*, however, I thought it very probable that his suggestion that they are only forms of one species was correct. The males look very different, one black, the other pure white, but the females are identical. I sent larvæ to Herr G. Höfner at Wolfsberg, where (on the Sau Alpe) *C. nivearia* is often abundant, and where I took it in 1897. Herr Höfner had bred the insect, and was, therefore, a good authority to say whether the larvæ of the two species agreed. Herr Höfner tells me he received the larvæ safely, and gave them fresh food of trefoil and dandelion. They took to the dandelion and fed on it, just as the larvæ of *C. nivearia* did. They were fullgrown and two pupated, mid-October in moss he gave them. A male emerged on November 24th. The larva of *C. nivearia* is brighter, but he cannot detect any decided difference between those of *C. peletieraria* and preserved larvæ of *C. nivearia* in his collection. He thinks that probably Staudinger's suspicion of there being only one species may be correct, but does not like to be positive, not having seen the ♀ of *C. peletieraria*. He philosophises that, if you are ready to let colour go for nothing, then *C. lutearia* would also be merely a form of the same species. It was, therefore, with the expectation of finding the ancillary appendages in the two species practically identical, that I prepared some specimens. The result, however, was to find differences that are no doubt of specific importance, although both are formed on a closely similar design. It will save much time and space in description to show the photographs of the ancillary appendages. It will be seen that, as regards the dorsal element (tegumen), *C. lutearia* and *C. peletieraria* are very similar, *C. nivearia* decidedly different, whilst, as regards the clasps, *C. lutearia* and *C. nivearia* are much alike, whilst *C. peletieraria* has the armature of spines (really apparently very short thick hairs) collected on a decided projection, instead of spread along the harpe. The appendages confirm what we otherwise know, that the three species are very closely allied, but also, I think, confirm the view that they have sufficiently differentiated to be accepted as "good" species.

EGG.—I first made acquaintance with the egg of *C. peletieraria* when some were laid on July 14th, 1904, by a ♀ taken at Pajares (Asturias). I did not, however, rear them. They were large oval eggs about 1.0mm. long, nearly circular in transverse section, the diameters varying only from 0.60mm. to 0.66mm., and possibly due to different sizes of eggs. The colour was nearly white. The sculpturing difficult to see, but consisting of hexagonal netting, the cells of which were about 0.025mm. in diameter. The eggs laid by the Pyrenean moths seemed to be much the same, and I took no description of them, but I have photographs of the empty shells, after the larvæ had hatched, by Mr. F. N. Clark and Mr. Tonge. These indicate that the egg is about 0.9mm. long, that it is somewhat flattened on one side, and that its two shorter diameters are 0.6mm. and 0.7mm. Mr. Clark's photograph, in which the egg is enlarged 100 diameters, shows the sculpturing admirably. A photographer would perhaps complain of this picture as being largely out of

focus owing to the curvature of the surface pictured, this happens, however, to give it additional value. At places it shows the network excellently, at others the fine grain of the shell reminding one of the dotted structure of the egg of *Cyclopides*, and again, just outside the ring of best surface focus, and where the thickness of the shell is in focus, the fine interstitial lines, seen also in "skipper" and various other eggs, marking the points where three cells meet. Mr. Clark has also photographed the micropylar rosette ($\times 250$), showing that, round it, the sculpturing is almost evanescent, although, a little way off, the points (or lines) marking the angles of the cells appear.

The larvæ hatched shortly after I got home in August, and were placed on *Lotus corniculatus*, which seemed to be quite satisfactory to them. I took a description of the living larva on September 20th, when they were full grown in the first instar, and later made a full examination of mounted skins.

LARVA (fullgrown in *first instar*).—The larva was very light griseous at first, is now 4mm. long, a bright reddish-ochreous; the markings are in longitudinal stripes, from yellow to brownish in tint, dorsal line dark, then a broad light stripe with darker middle, then a broad darker stripe with median white line; perhaps better stated as two darker bands divided by a very distinct pale line; there is a broader pale marginal flange stripe, below this darker, divided from the ventral region by a pale line, or rather the ventral region below the marginal pale band, is divided into five equal parts by four pale lines. The darker parts, especially ventrally, are really the more transparent portions of the skin. The larva is certainly not long and slender, nor is it short and stubby. The dimensions are much the same throughout; the incisions marked, but hardly making the segments beaded; the head the same colour as the skin, with large black eyemark; it is still fully half the thickness of the larva in diameter. The tubercles are minute black dots with very short hairs; the anal plate and plates on claspers fuscous; the prothoracic plate is of the colour of larva with a row of four shining brown bristles on the front margin. I have not sufficient knowledge of Geometrid larvæ in their first stage to know which are family, which generic, and which specific, characters; I can, therefore, only describe what I see, without attempting to assign to each character its significance.

The head, 0.4mm. in diameter, has a rough surface, due to a raised pattern, more or less in a minute network, the lines of which are, however, of varying thickness, and, in many places, appear to end by trying to pass under a neighbouring strand. The lines radiate, or, rather, the cells of the network are, in some degree, in lines, radiating from the hairs. Of the hairs, one notes on either side one near the middle line above clypeus, one close to the clypeus, about one-third down it, two others at about equal distances apart in line with the last towards the antennæ, one at almost the centre of the half cranial plate; there is another nearer the vertex, and one or two near the antenna; they are about 0.04mm. in length; each has its definite position. The clypeus has a smoother texture, and has a pair of hairs about the middle, and another lower down, and rather further apart. The jaws have four strong sharp teeth. The antenna has a broad short basal joint, a thick large middle one, with some strong bristles, one so short and thick that it might be regarded as a further joint.

There is a similar thick short process on the second joint like a small duplicate of the third one. There are five large convex eye-corneæ in a semicircle, and another (making six) near its centre. The labrum has the usual kidney-shape (the median notch as the hilum). The prothorax carries a plate, about 0.17mm. long and 0.4mm. broad, oval, but that the posterior margin is nearly straight across; if each half were divided into three equal pieces by two lines, the four hairs on each half would be one towards each end of these lines; they are very short, about 0.025mm., and slightly thickened in the middle. The plate itself is marked by a few lines of raised network. Just beyond the end of the plate, almost attached to it, is a very small dark plate with two minute hairs. The spiracle is just below and some way behind this, there is a solitary longer hair (0.05mm.) some way in front of the spiracle, and a pair below near the leg. The leg itself has a hair or two on its basal plate; the three joints and claws are together about 0.25mm. long. The spiracle itself has a raised convex base with a raised narrow crenate border round the opening. The mesothorax has six (three on each side) very short (about 0.03mm.) hairs, about equally spaced across the dorsum, and just beyond and in front of, and close to, the outer, so close that they form an obvious pair, is a comparatively long (0.13mm.) slender hair; below that a single hair at about the spiracular level, another lower and further back, in line with the two at base of legs (on prothorax); the metathorax is the same as the mesothorax. The 1st abdominal segment has tubercles i well apart, tubercles ii further apart and well back, and iii well down towards spiracle; they are all well apart, and divide the area with fair equality. The spiracle is smaller, but of the same structure as in the prothorax. Just below it are two hairs on a level a good way apart, the front one more in front than the posterior is behind the spiracle; below these a solitary hair (vi), well back, and another nearly ventral. The 2nd abdominal segment differs from the 1st in ii being very near the posterior border of the segment, and being nearer the middle line, very

. i .
 sp. o . iii . o
 . ii .
 FIRST SEGMENT.

. . .
 sp. o . . o
 . . .
 SECOND SEGMENT.

little further out than i, whilst iii is notably further out; iv and v are further back, the spiracle is above a point midway between them, instead of being much nearer the posterior tubercle. Below are tubercles vi, vii, and viii (if the lowest is viii) in a line across segment, about equally apart, vi the largest. On the 3rd, 4th, and 5th abdominal segments, vi is further back, and has another hair behind it, and there is below only vii (or viii); on the 6th iv and v are, one below spiracle and the other behind and at a level midway between the first and the spiracle, and vi and vii are represented by minute hairs most difficult to see. The prolegs of this segment have the appearance of being attached to its posterior border. There is a plate with two hairs, ventral to this a rather large hair with large base, and then the

series of hooks which appear to be attached to an antero-posterior very narrow strip of chitin, which extends beyond them posteriorly; the hooks are an anterior and posterior pair with four or five points between them, the posterior of which, though small, is almost a hook. The posterior prolegs (claspers) have four hooks as an outer or anterior set, and three as an inner, with about seven abortive points between. The 7th abdominal segment has no prolegs, but the hairs are disposed as on the 6th. On the 8th abdominal i and ii are comparatively crowded together, nearly into a square; iv and v are again both below the large spiracle, vi is at posterior border of segment, and vii (?) is below. On the 9th, i is larger, ii wanting, iii well up and forwards; there are three hairs below spiracular level. The 10th abdominal has a large anal plate with four hairs along its posterior border, one on each side, halfway up, and one below this, in from the border, quite on the disc, a total of eight hairs. The claspers have a large plate with seven hairs and a narrow plate with two. The hairs are for the most part very small, with dark round hemispherical bases, transparent, somewhat clubbed, with some spiculation or division as for a glandular opening at the apex, the longer hairs are simple, about 0.02mm.-0.03mm. long., but larger and stronger as we approach the end segment; on the 6th abdominal the longest are perhaps 0.05mm., and on the 9th and 10th about 0.09mm. The skin-surface has a network outlined in fine dots giving polygonal spaces of very varying form, and often being as if the division between several were missing. The hair-bases have processes that radiate into these lines, as if they were starting-points for them, although the skin looks nearly structureless in the line of i and ii, and again of iii, and is well marked out in the intervals (*October 9th, 1907*). *Second instar* (from living larva): Is a straight cylindrical larva that keeps itself straight under all circumstances when at rest; towards next moult 7.0mm. long, 0.8mm. wide, head rather narrower, and flaps of claspers making a little lateral projection. The colour is ochreous-brown, with longitudinal lighter and darker lines; between a double pale dorsal line is a darker shade, intensified into a short, nearly black, streak in the middle of each segment; there is, subdorsally, another fine pale line, and the space between this and the dorsal line presents also a dark mark at the front margin of the segment, then follows a darker space, a pale almost yellow line, then a ground colour space, then a pale yellowish flange line, rather wider than the pale lines above. In the fullfed larva there is no flange projection, but the yellow line (subspiracular) makes the larva, from some points of view, look as if there were one, below the yellow line is a darker band, ventrally again is paler, with two yellow lines. The head, legs, etc., are self-coloured, and no hairs or tubercles are seen with a hand lens. In the second instar, from a mounted skin, the larva is very like the first, but larger. The hairs and tubercles seem to be precisely the same, but with certain additions. The prothoracic plate is now long and square, with four hairs along the front and four across the middle. The hairs are, for the most part, but little larger than in first instar, but the long hairs of the anal plate are about 0.1mm. to 0.12mm. The spiracles have a broader border and smaller opening, and the crenate rim is less evident. The prolegs of the 6th abdominal have three hooks at either end and seven intermediate nodules. The claspers have four hooks at each end,

and fifteen or sixteen intermediate points, on end one or two small but hooklike. There are, compared with the first instar, additional hairs below the spiracles; on the 2nd abdominal there is a hair a long way to front of vi, then vii, viii, and ix in line along zone of segment; on the 4th abdominal segment, the hairs here called vii and viii are at the same level with one called ix, probably viii, below. This continues on the following segments; there can also be seen a very minute hair at front of segment, between i and iii, and another between iii and spiracle. After the second instar the larva has three more moults, and in the third, fourth, and fifth instars differs little, except in size, from its appearance in the second; the markings are, perhaps, more pronounced and darker; the lengths are about 10mm., 14mm., and 20mm. The colours are deep chestnut and black, the markings as described under last instar, and as may be seen in the excellent photograph by Mr. Main. In the last instar, and in some degree in the previous ones, the additional minute hairs noted under the second instar, are more easily seen, as well as the skin sculptures. There are seven tubercles below the spiracle, on either side, on the 1st abdominal segment, two (iv and v), two (vi and ?), and then three in line, but on the 2nd and following segments the second of the three in line has a companion, making eight. The minute points, dorsal and spiracular, are as in the second skin. The skin appears to consist of raised round discs with puckered tissue between (skin-points with round flat tops). The prolegs consist of a straight line, carrying at each end eight hooks alternating smaller and larger, and, between, eight dark points of which the end ones are rods half the length of the hooks. The claspers have ten hooks at each end, and about fourteen points between, similarly slightly advanced towards being hooks at each end. The head, thoracic, and anal plates have a special sculpturing difficult to describe, intermediate patterns between this and the usual skin-pattern occur in places. There are raised ribs, half as broad as the spaces between them, they bend and branch in the most irregular way, branches ending often in hollows between branches of another rib; the spaces between are of most irregular shape, squares, triangles, long zigzagged strips, etc., yet giving the impression they are all of the same size. The jaws have at one end a short sharp tooth, then three long sharp ones, then three each smaller and more rounded than the last, and a portion, nearly straight, twice as long as the last tooth, but suggesting that it also is divided into, or would like to be divided into, continually diminishing teeth. *Fullgrown larva*: On October 11th, one larva has pupated and another has spun up, and a considerable number are in last instar. When fullgrown, the larvæ are 18mm. long. The form, colouring, habits, and attitudes have changed little since the second instar. They rest very stiff and straight along the stem of the plant (*Lotus corniculatus*), with the tips of the legs collected together close to the mouth. They have a very decided subspiracular flange, making the rather broad larva look broader than it really is on a dorsal view. The width of a well-fed specimen is about 2.6mm. If on a small enough stem, the claspers go round it, and the end of the anal plate rests closely on the stem, and that extremity of the larva looks pointed, on a flatter surface the claspers are extended, and make the end look wide. When on the move, it has a curious habit at times of holding by the prolegs, and laterally vibrating the front

portion to and fro. The colours are pale yellow-brown, rich red-brown, and black. The markings are in longitudinal lines. The lateral flange forms a yellowish line, three other yellowish lines occur between this and the dorsum, with wider, darker spaces between, and a narrow dorsal band between the two most dorsal yellow lines. The dorsal band is the narrowest, and the three below it (to the flange line), on either side, are successively rather wider. The dorsal band is red-brown, with black on the middle of the segment, and a smaller black mark at the posterior border. The next (subdorsal) band has rather more black than red-brown, the brown being at middle, the black at margin of segments, with a faint pale line down the middle of the band. The third band is uniformly dark. The fourth and broadest contains the spiracle, is without black, redder at the margins close to the bounding lines, and presents most distinctly what obtains less obviously in all the markings, that they are made up of fine lines and dots, or marblings. Beneath the flange line is a broad, nearly black, band, then a pale fine line, then a broad reddish band, and another pale line, leaving a narrow ventral band, also pale reddish-brown, but with a square black mark in the middle of abdominal segments 2, 3, 4, 5, and 6. These markings continue from the 9th abdominal forwards to the 1st, the spiracular band on the thorax is dark, and tends to fuse with the dark one above it. The anal plate is cinereous, with red-brown dots and margin, the clasper flaps are similar. Head ochreous, with brown markings, small and numerous; eyes quite black, legs same as head; forward prolegs same as the ventral band; spiracles conspicuous black dots; width of head about 1.5mm., the body narrows a little to it from about the 2nd abdominal segment. The abdominal segments have a broad front subsegment, three median narrow ones, and a broad posterior one, which has indications of consisting of two. The lateral flange has marked segmental incisions, and is very distinctly divided into four nearly equal portions by subsegmental incisions on the forward abdominal segments, in the latter into a large front and smaller posterior one. The larva has a habit, when moving, of vibrating to and fro laterally, in a way similar to that seen in Geometers and other larvæ. A ♂ moth emerged to-day (October 27th, 1907), pupated October 11th. There are now eight or nine spun up, and some still feeding, all in last instar (one?). On October 31st, a ♂ emerged; on November 1st, another ♂ emerged.

PUPATION (November 1st): I gave the larvæ for pupating only some bits of filtering paper, several selected, rather than use this, to pull together stems and leaves of foodplant, in two or three instances, when a small plant with its root was afforded, going down amongst the crowded stems close to the root, and here spinning its cocoon; others, however, used the paper; I concluded that any thicket of vegetation close to the ground, whether of living or dead material, would probably be the natural situation of the cocoon. The paper gave, perhaps, the easiest means of observing how the cocoon was constructed. As complete an enclosure as possible was selected, and the open spaces closed by silk, drawn across as an open network, through which the pupa could be seen. When I say network, I mean a tangle of threads which ran together into strands, so as to have many openings, mostly nearly circular, of various sizes up to about 1mm. in diameter, into this network was, however, also worked little bundles of

fibres of the paper, not amounting to bits of papers, but little more than the few fibres one might suppose the larva to pull off as a mouthful. The paper had little or no silk lining, except to attach the covers of openings. The pupa possesses a cremaster, but of such little efficiency that the pupa almost at once comes loose when the cocoon is opened.

PUPA: The pupa is of a rich lively red-brown (a common pale chitinous pupal colour), the anal segment darker, and cremastral spine nearly black; 12.5mm. long, 3.5mm. thick, at the 3rd and 4th abdominal segments. The most marked features of the form of the pupa is one seen in other Geometers, *viz.*, the appearance that the appendages and wings are added to the pupa on the outside, and are not as in *Noctua*, *Notodonta*, etc., worked into the general outline. Thus, seen laterally, the ventral line, where it reaches the end of the wings, antennæ, etc., drops back suddenly to the 5th abdominal segment; again, viewed dorsally, at the end of the wings the pupa suddenly narrows in half the length of the 4th abdominal segment from 3.5mm. to 2.5mm. The metathorax and first four abdominal segments, though normally rounded, lie, as it were, in a trough, the wing margins rising suddenly on either side, *i.e.*, the segments are formed in a circle, 2.5mm. in diameter, the wings are moulded to 3.5mm. Seen dorsally, the pupa is rounded in front, about 3mm. wide at mesothorax, gradually widening to 3.5mm. at the 4th abdominal, 2.5mm. at the 5th abdominal, and tapering to the 9th abdominal, 0.8mm. wide. The dorsum is fairly straight from the mesothorax to where the tail begins to taper. Ventrally, the face projects forward a little at front of mesothorax, the height is 2mm., thence the ventral line has a convex curve to the end of the antenna, 8.2mm. from front. The spiracle of the 2nd and 3rd abdominals, and to a slighter degree of the 4th, have the appearance of having been pushed backwards by the wings, and of having shoved up concentric folds in front of them in this movement. The tips of the maxillæ project about 0.5mm. beyond the wings, and are supported by the antennæ and second legs (and third behind maxillæ?). The second legs are very narrow, ending in a long slender point forwards, and are then shut off from the face by the first legs, which reach within a millimetre of the end of the wings. The wings show the veins markedly as slightly raised lines, and end in a Poulton's line, where there is a sharp angle, the fall from wing to body level being almost entirely in the slope of the strip beyond the line, which is, as usual, unmarked by venation. The antennæ show the pectination well; the cremastral spine is conical, about 0.4mm. long, rugose, with fine wrinklins and ends in two harp-shaped spikes; laterally are three or four, on each side, extremely fine bristles, also S-shaped, so weak and slender that one is not surprised at the slight hold the cremaster takes of the silk of the cocoon.

DEHISCENCE.—The head, head-parts, and legs separate in one piece, but remain attached by some shreds of internal membrane (third legs?) to the 4th abdominal segment. The antennal bases may be slightly separate from the head, and in one specimen one eye-cover has fallen out, and the dorsal headpiece has fallen separate. The prothorax splits dorsally, and each half remains attached to the mesothorax by thin membrane, that often gives way. The mesothorax splits dorsally for about one-third of its length. The ♀ pupa differs from the ♂ in

the body being more robust, and the wings and appendages more level with, and less like, a cloak overlying it. The 8th abdominal segment also has ♀ structure. The corona of the 10th segment and cremaster appear to be identical in both sexes. A ♀ emerged November 21st, 1907.

EXPLANATIONS OF PLATES XI-XVII.

PLATE XI.—FIG. 1.—Empty eggshell ($\times 100$). The varying focus, due to the curvature of the shell, gives the sculpturing as seen at different levels. The centre is almost below the inner surface, round this the hexagonal markings are well shown, outside this they are less distinct, but the black lines or points at the angles appear, a little further out the focus fails.

FIG. 2.—The micropyle ($\times 250$). The transverse lines in middle of figure are merely the result of folding in pressing flat the stiff curved eggshell.

PLATE XII.—FIG. 1.—Eggshells ($\times 30$) are in sufficiently varied positions to indicate the form of the egg, more easy to see than to describe, the sculpturing is also indicated.

FIG. 2.—Proleg of larva in penultimate stage, showing a continuous row of crochets, of which the terminal ones are well-developed, the centre reduced to chitinous nodules.

PLATE XIII.—Left half of prothoracic plate of fullgrown larva. The middle line of plate is near right side of figure, its left margin in front of, and to right of, the spiracle. The size and nature of the hairs are well-shown, and the colouring and sculpturing of the plate are very fairly reproduced.

PLATE XIV.—Three skins of larva in 1st stage and one in 2nd, spread out flat ($\times 15$) to show the disposition of the tubercles.

PLATE XV.—Figs. 1 and 2.—Larva in 3rd instar	} All $\times 2\frac{3}{4}$.
Figs. 3, 4, and 5.—Larva in 4th (last) instar	
Fig. 6.—Skin of larva in 4th (last) instar	
Figs. 7, 8, 9, and 10.—Four views of pupa	

PLATE XVI.—FIG. 1.—End of pupa. Showing crenulations of anterior margin of dorsal aspect of 10th abdominal segment. The reproduction in plate indicates, but hardly shows, the fine spiculation along the margin of the crenulations. The structure of the cremastral armature is well seen. The darker portion of the figure is where, in the irregular breaking of the (brittle) pupa in mounting, two thicknesses of pupa-shell are present.

FIG. 2.—Male ancillary appendages ($\times 30$). Clasps spread to either side in the manner that is most satisfactory in the majority of Noctuids and Geometrids. To be compared with pl. xvii.

PLATE XVII.—Male ancillary appendages of (Fig. 1) *Cleogene lutearia* and (Fig. 2) *C. niveata* ($\times 30$), mounted in the same way as those of *C. peletieraria* (pl. xvi., fig. 2), for comparison. It is remarkable how much more these are alike than *C. peletieraria* is to either.

The lifehistory of *Chattendenia* (*Edwardsia*) w-album.

By A. M. COCHRANE.

The Rev. F. E. Lowe's "Notes on the lifehistory of *Lampides boeticus*" (*antea*, pp. 139 *et seq.*) must give all lepidopterists food for reflection. How truly he says that chance makes some one particular family or species of butterflies, a special favourite with most of us. He has told us that, in his case, it is *Lampides boeticus*; that, so recently as 1899, he wanted information of this species, which was that year breeding freely in the Channel Isles from immigrant parents, that he searched in vain for information through the available literature, and that, to date, no consolidated reliable facts relating to the habits of this species have been available, and now, suddenly, a detailed lifehistory of 50 closely-printed pages (pp. 329-378) is placed at his (and our) disposal, much of it

printed in small type, the recent observations and careful descriptions made by the author, Mr. Graves, and Dr. Chapman of its "oviposition," "egg," "larva," "pupa," and "habits," being added to all the details amassed here and there from the time of Réaumur (1780), and now thrown together in one connected whole, until one reads on as if the lifehistory were a simple series of observations made during the few weeks preceding publication. The idea of Mr. Graves, in Egypt, procuring living material in late October, that could be sent, and worked out, at home, in our early winter, and so help to fill up any hiatus that might occur, is, in itself, a revolution in the way of obtaining a lifehistory of a little-known species. In a case like this, even for entomologists, time seems largely to have been annihilated. But Mr. Lowe has said enough of *Lampides boeticus* to put all real workers on the right track. My especial weakness is *Chattendenia* (*Edwardsia*) *w-album*.

One can, like Mr. Lowe, congratulate oneself that the specific name remains unchanged. On the contrary, however, in the generic name the author has been unfortunate, and, naming the genus after one of his chief helpers, Mr. Edwards, finds the name already twice preoccupied, and it becomes necessary to change it in the "Addenda" to *Chattendenia*. There can be no doubt why "*Chattendenia*," for there must be hundreds of lepidopterists whose series have come from the fine old "*Chattenden Roughs*" of *iris* fame, that climb the hills above Frindsbury, Upnor, Cooling, and Cliffe, and nod across the Thames to Mucking on the other side. Excellent historical entomological ground this now, to be handed on to future naturalists as it must of necessity also be to future Dickensians. The wych-elms in Chattenden are nearly everywhere. On those near the gate of the Cliffe entrance scores of larvæ of *Chattendenia w-album* have sometimes been beaten, even from the main road. The trees that lead from Four Elms Hill to the entrance near the keeper's house, and those that lead up past Eley's Farm, in some years abound with the species, the imagines of which are to be seen in dozens circling round their tops or feasting on the bramble and privet blossom near. Of its abundance in the "*Roughs*" itself the author speaks fully. *Chattendenia* is, if a new generic name be wanted, a good one for *w-album*. Its specific name appears to be as firm as such unsteady things can possibly be.

Some years ago I wanted to know something about its lifehistory. I knew it fed on elm, and what the fullfed larva was like, but I wanted to know something about its egg, the time of hatching, the larval habits, its mode of pupation, some explanation, if possible, of its gregarious imaginal habits, and so on. I turned up Newman's *British Butterflies*, and found something less than two pages. I found the egg "was shaped something like an orange, but more depressed on the crown, and of a whitish or putty colour." What a parody this on the truth, as set out by the author and Dr. Chapman in the new volume, pp. 153-154 and 189-190. Not a word on the "habits of the larva," which Messrs. Bird, McDunnough, Rayward, and Dr. Chapman have, in the early larval stages, now so excellently worked out, and which the author's own notes show that he himself knows so well. Voelschow's remarks are, as is noted (p. 156), very remarkable, and his conclusions one suspects not at all probable. Nor did reference to Buckler's *Larvæ*

help me, for he merely figured the larva and pupa without a word of description, and this seemed to have been largely the origin of Barrett's information, so that one can say honestly that of the lifehistory hitherto nothing was really known. The attention that the author and his helpers have given to the "larva" and "pupa," and everything connected therewith, will attract the real naturalist, and the field-worker should be able to clear up some of the strange details quoted by various authors as to possible "foodplants," of which "ash," "lime," "oak," "sallow," and "sloe" all look a little impossible, although Newnham vouches for "ash," whilst Réaumur's observations on "the larval preparation for pupation," written in June, 1730, are almost incomparable.

Of other interesting items absolutely ignored by all other British authors, the extended notes on the "scales" and "androconia," the detailed account of the "variation," of which *semialborigata* is a very remarkable form, are very attractive; whilst the notes on "habitats" and "habits" breathe of the fields and woods, and bring to mind the lovely days we have all spent in the woodlands of our own "home" county, whichever it may be, the woodlands of France and Central Europe, or the wild slopes of the alps where this species occurs. Its British range gives us some 40 counties as against the 22 of Newman and 21 of Barrett and South, the latter of whom, in his recent work, seems largely to copy the former, and, how fatal this copying is, for Barrett says that Yorkshire appears to be the "northern" limit of this interesting species, that "in the west it is recorded no further than Cheshire and Shropshire"—yet our author turns out a record for "Dumfries" by Lennon (an excellent collector in his day); he also notes it from "Carnarvon," "Flint," "Glamorgan," "Merioneth," "Monmouth," "Radnor," and "Somerset," all of which are beyond the western limits of Barrett, as copied by South. Similarly, South gives it as only occurring "in Essex, generally common near Maldon," whilst our author notes it as occurring in "Essex: appearing to be wherever there is wych-elm, and generally distributed—Epping (Doubleday), Bergholt Woods near Colchester (Harwood), Maldon (Fitch), North Fambridge (Whittle), Stanstead (Spiller), Witham (Burnell), Beeleigh, Coggeshall, Danbury, Hazeleigh, Purleigh (Raynor), etc." Similarly, in most works, the old record of Stephens in 1835 largely does duty for "Surrey," whilst in the new volume we find "Guildford, Godalming, Witley, Cobham (Newman), Ripley near Windsor (Stephens), Esher (Fleet), Claygate (Barrett), Shere (Tremayne), West Wickham Wood (Fletcher), Chertsey (A. H. Clarke), Box Hill (Oldaker), Reigate district (Tonge), etc." As a final shot against haphazard copying, I would note that South, in 1906, observes that "the egg has been described as whitish in colour, and is, in shape something like an orange with a depression on the top," yet, in 1897, an actual detailed description of the egg of *Chattendenia w-album* was available (*Ent. Rec.*, ix., p. 292), i.e., published ten years earlier than this erroneous description was copied from Newman.

Of the plates illustrating this special species, besides the figures (pl. i) showing the chief forms of the imago, there are many points to notice: (1) The marvellous difference between the egg of this insect and those of its allies as exemplified in pl. ii, in which the eggs of all the British "hairstreaks" are beautifully reproduced from photographs by Mr. Tonge. (2) The great difference also between the pupal hairs

of this species (pl. iii., fig. 1) and those of its allies (pl. iii., fig. 2), etc. (3) The remarkable structure of the pupal head and thorax, mounted by Dr. Chapman and photographed by Mr. Clark (pl. vii). (4) The marvellous difference in the structure of the larva of *Chattendenia w-album* (pl. vi., fig. 1) in its first instar, and those of *Strymon pruni*, *Ruralis betulae*, and *Bithys quercus* (figs. 2-4), excellently drawn by Dr. Chapman under a "camera lucida"; whilst (5) pl. viii, depicting its "lifehistory," from photographs by Messrs. Main and Tonge, is only not the best in the volume, because in pls. iv. and ix., illustrating the lifehistories of *Callophrys rubi* and *Strymon pruni*, these gentlemen have excelled themselves. There are no lifehistories anywhere published from nature comparable with those which Mr. Main and Tonge have done for this volume.

But enough has been said. We know now what our author would call the main facts of the lifehistory of *Chattendenia w-album*. It occupies 48 closely-printed pages, i.e., two pages less than Mr. Lowe's favourite, *Lampides boeticus*, but is in every way as excellent a lifehistory, as interesting in all its details, and, in addition, it is a "homester," not merely an "immigrant," or, if one dare say it, a "desirable alien."

The Entomological Society of London's First Conversazione.

On the evening of Friday, May 13th, the Entom. Soc. of London held its first Conversazione at Burlington Gardens. The arrangements were in the hands of a strong Committee, including Messrs. R. Adkin, Rowland-Brown, H. St. J. K. Donisthorpe, S. Edwards, A. H. Jones, Dr. Longstaff, Professors T. H. Beare, R. Meldola, and E. B. Poulton, some of whom had had considerable previous experience. The large rooms at the Burlington Gardens were placed at the disposal of the Committee, a variety of exhibits of great entomological interest were brought together, the catering arrangements were placed in the hands of a well-known firm of caterers, an excellent ladies' band provided, and everything passed off splendidly. As a social function the result was particularly good. For years past, many of the better-known entomologists have, by means of the meetings of the Entomological Club, the annual invitation of the Council of the Ent. Soc. of London to Oxford, and by friendly dinner-parties, done much to place the friendship of entomologists on an assured personal, as well as entomological, basis, and have largely succeeded, but the attempt to bring the wives and daughters of entomologists into a common bond, has hitherto been left to the South London and City of London Entomological Societies, which, essentially, the great feeders of the Entomological Society of London, have, as it were, indirectly, brought a great deal of personal friendship into the membership of the latter. Still it is quite possible for a retiring Fellow of the Ent. Soc. of London to be a member of the Society for years and yet to be practically unknown. One suspects that, at every meeting, there are some such Fellows, whom the officers themselves hardly know—personally or entomologically.

This being so, anything that will break down this exclusiveness must make for advantage. The tendency for the production of combined work is getting more and more apparent; the help of other workers is always being invoked by those who publish most largely,

and it is difficult to persuade some people that what they know is worth telling, even when one knows them well; others, who are largely solitary in their entomological habits, are hardly to be persuaded at all, and their work fails because no one knows of it and they tell no one of it.

Social functions then make for progress. We saw on May 15th entomologists who had made it their business to come from far-distant places, and many north of England, Scots, and west of England entomologists—possibly others from Ireland and Wales—with their wives, daughters, and sisters were present. We have no doubt that many invitations to visit were given and accepted, the origin in many cases of a life-long friendship.

The Committee had arranged for three illustrated lectures—(1) Mr. Donisthorpe—"Ants and their Guests." (2) Major Ross—"Sleeping Sickness." (3) "Mimicry and Warning Colours," by Professor Poulton. Mr. Donisthorpe's lecture was very successful, but that of Major Ross was drawn out far beyond the allotted time, and so Professor Poulton's had to be missed, a great disappointment to many.

Among the exhibits there were some most interesting things—Mr. Donisthorpe's "ants' nest" attracted a great deal of attention, as also did Mr. Newman's living butterfly larvæ, and the excellent pictures of *Coleophora* and *Lithocolletis* by Miss Garnett. The paintings of the aberrations in the "Capper" collection were very unequal, but some were very nice. Why have these not been published as a contribution to knowledge even though the expense were personal and the matter considered less as business than as a labour of love? The old masters did these things, their work could never have "paid" in the modern sense, but everything must pay now-a-days in a commercial sense, and the days of patronage are largely over. One wonders whether, on the whole, science—except applied science—has not lost by it. We get a large quantity of matter printed now, but is the actual advance equal to that made by the few in bygone days? One looks round the room and wonders. It is the good things that are, as a rule, not pushed. They do not appeal to the million, and they are still hidden in private drawers, whilst Popular entomology so-called is served up for the Public.

Mr. Elwes' exhibition drawers, glass both sides and turning round "lucky-box" fashion on a swivel, are an excellent departure. Numbers of first class exhibits in exotic insects of all orders, Palæarctic lepidoptera, British lepidoptera and coleoptera attract attention. Marvellous microscopes fitted with almost everything that the heart of microscopist could desire; beautiful cases arranged to exhibit certain phases of mimicry and protective resemblance, over which Professor Poulton presided, and the details of which he explained simply and effectively over and over again to the uninitiated, were also noticeable. To see Mr. and Mrs. Hanbury reminded one of the great Entomological Conversazione held by the City of London Ent. Society at the London Institution some few years since, and provoked comparisons, not altogether unfavourable to the past. Mr. and Mrs. Adkin reminded one of the many similar successful ones they have helped to engineer for the South London Entomological Society. Past-Presidents and important people galore were present, but entomologists who wish to know of them should have been there to meet them, and we cannot unfortunately deal with this phase of the matter. It were, indeed, too vast.

One thing is certain, the *Conversazione* has come to stay. The programme of future ones should be elaborated in detail long before the next takes place; the details of time, place, cost of tickets, etc., should be well-advertised in all the usual entomological magazines, and there need be no uncertainty as to the actual success, a success that does not end with the evening's entertainment and enjoyment, but is carried on in the many happy hours that will be spent by newly-found friends over books and insects in those strangely secret corners that are the surprise and envy of the world—the parlours and libraries of the homes of Britain.

A Note on *Nonagria neurica*, Hb. (=neurica, Tutt, "Brit. Noct.," i., p. 49) and *Nonagria edelsteni*, n.n. (=neurica, Schmidt, and Edelsten, "Ent. Rec.," xix., pp. 56-59.)

By J. W. TUTT, F.E.S.

Some 20 years ago (*Ent. Mo. Mag.*, xxv., pp. 56-7) I wrote a note concerning *Nonagria neurica*, Hb., a species in which, at the time, I felt considerably interested, and which, of course, although dealing in the main with the species we knew in Britain under this name, also took into account the references to the species by Continental authors, the references being based on the assumption that the insect they referred to, *neurica*, Hb., agreed with his figure of the species. In *Brit. Noctuae and their Varieties*, i., p. 49, I re-affirmed the position that *neurica*, Hb., in spite of the faultiness of drawing, was referable to our species, that the essential ocellation was particularly noticeable in the lower part of the reniform, that the shape of the wings suggested ♀s which I had from Cambridge, although the abdomen of Hübner's figure suggested a ♂. [The abdomen of many of Hübner's figures are more or less diagrammatic, and the point did not (and does not) appear to me at all vital.] The essential note of my observation was that, in Britain, we had only one species, and that, on Hübner's figure, our species was *neurica*. Of the other matter, whether there were two species or not confused under the various names on the continent, I was not directly concerned, but merely discussed the remarks of Treitschke, Schmidt, and Staudinger, with regard to their references to *neurica*, Hb., apart from their references to *arundineta*, Schmidt, all being apparently referable to the species we get in Britain.

Recently Mr. Edelsten became interested in the matter, came to the conclusion that there really were two species on the continent, and referred them, as Schmidt and Staudinger had already done, to *neurica*, Hb., and *dissoluta*, Tr. (or rather *arundineta*, Schmidt), respectively. He figured the species (*Ent. Rec.*, xix., pl. ii., figs. 1-12), dealt with certain differential points in their life-histories, and finally gave a comparative table of the essential characters relied upon for the distinction of the two species (*Ent. Rec.*, xix., pp. 1-4, 33-37, 56-59).

The imaginal characters on which the species are differentiated by Edelsten (*op. cit.*, p. 59) read as follows:—

NEURICA.

Collar white.
Central streak blackish, containing three white dots, the outer one forming the central spot.
Underside quite plain, with no markings.

ARUNDINETA.

Collar same colour as body.
Central streak blackish, no white dots, central spot black, encircled, or partly so, with white.
Underside showing the central spots and marginal lunules.

I may add that on May 1st, Mr. Edelsten came to my house and brought a specimen of what he calls *neurica*, and which satisfied the differential points he had laid down. Without going any further it struck me that this example was not essentially like my recollection of Hübner's fig. 381, and that the point at issue was, after all, the determination of Hübner's figure, and Mr. Edelsten agreed that this was so. I referred to *British Noctuae and their Varieties*, i., p. 49, where I had described Hübner's fig. 381. I read this description against Edelsten's characters and specimen that he had with him. I pointed out that the figure had "no white collar," no "three white dots" along the central line, whilst, being an upperside figure, the underside could not be referred to. On the contrary, I pointed out that my description noted "a row of five or six small longitudinal spots along the median nervure, the lower half of the reniform occurring as a dark spot surrounded by a whitish ring," the latter coinciding exactly with his diagnostic character of *arundineta*, though not with the specimen which he had with him and called *neurica*. He then suggested that I had made an erroneous description, which appeared to me impossible, as I copied all these descriptions from the original works, and so comparison was made with Hübner at the first opportunity, May 5th. The figure tallies absolutely with my description, it shows "no white collar," merely the pale-tipped cilia on the crown; it shows no "three white spots" along the median line, as it ought to do were it *neurica*, Edelsten; it shows the bottom of the reniform as "a black spot encircled with white," as it should do were it the *arundineta* of Schmidt, and the *neurica* of Hübner, and of Britain. The details of the elbowed line, etc., also agree with our insect. As a result of this examination I confirm my description as accurate, and I insist more strongly than ever that our British species is *neurica*, Hb.

It is to be confessed that, like so many of Hübner's figures on which one has to form a critical opinion, fig. 381 is defective; its ground colour is not good, but it is equally bad for Mr. Edelsten's other species, which seems to me to agree with our insect (as Schmidt also remarks) in ground colour, shape and general appearance. In wing-shape, Hübner's fig. 381 comes broadly nearest to Edelsten's ♀ figure, *Ent. Rec.*, xix., pl. ii., fig. 7 [from a ♀ var. *arundineta* taken by Schmidt himself (see *op. cit.*, p. 59),] being somewhat triangular, and altogether wanting in that squareness of wing which characterises the ♂, and which is, admittedly, our species; the hindwing, too, is much too dark for anything that Mr. Edelsten has figured, but of that peculiar dark grey which an artist is inclined to make black and a photographer brings out almost white, the body, too, is as hopeless for one insect as the other, if the wings be considered ♀. But, if a critical opinion is to be founded on the insect, the one character that stands out is Edelsten's of *arundineta* (*Ent. Rec.*, xix., p. 59), "central spot black, encircled, or partly so, with white." Whether this be really a specific character or not I do not know. Whether or no there be two species I am not prepared to discuss, but I do know that Hübner's fig. 381 agrees on Edelsten's own showing with *arundineta*, and not with the insect he calls *neurica*, in other words that *neurica*, Hb., fig. 381, is Edelsten's *arundineta*.

Edelsten seems to have satisfied himself that his *neurica* is that of Schmidt, but his supposition (*op. cit.*, p. 57) that *neurica*, Tutt, *Brit.*

Noct., i., p. 49, is anything to do with *neurica*, Schmidt, is too hopeless for words. I knew nothing of *neurica*, Schmidt. *Neurica*, Tutt, *Brit. Noct.*, i., p. 57, refers distinctly to *neurica*, Hb., that is, to our British species, and as such it must be understood. In my opinion we have only one British species=

Neurica, Hb., "Eur. Schmett.," fig. 381; Tutt, "*Brit. Noct.*," i., p. 57. *Arundineta*, Schmidt, "*Stett. Ent. Ztg.*," p. 369 (1858), etc.

It did, of course, occur to me, when I previously discussed the matter (*British Noctuae*, iv., pp. 101 *et seq.*) that Schmidt was referring an insect with (1) three white dots in the black, central streak of the forewing, (2) a white collar, and (3) with plain underside, to Hübner's fig. 381. These characters had just then been evolved by Schmidt, but, and this is important, they are not in Hübner's figure, nor did Hübner know anything about them. They are the offspring of later accumulations around the name *neurica*, and, on Schmidt's statement that "the size, shape of the wings, and markings, are almost the same in both," I was inclined to think it was merely a variety, and I took it for granted that Schmidt had two forms before him, *viz.* (1) one referable to Hübner's fig. 381, into which he had read these special characters. (2) Another form which he had named *arundineta*, and which everyone agreed was our common ♂ form, and included specifically the dark form *dissoluta*, Tr. On these grounds I had not the slightest doubt that these should be referred to our species. It would appear now on Edelsten's showing, that Schmidt, Staudinger, Püngeler, and other German entomologists have a species that they have erroneously referred to Hübner's fig. 381, and which does not in any of its tangible characters agree with fig. 381. This species I do not know. All the while, however, we speak of *neurica*, Hb., we must restrict ourselves to Hübner's figure and the characters that are presented by that figure, and not read others into it that are not there. Hübner's *neurica* must be, poor as it is, referred to our *neurica*, with the pale-ringed, dark, lower part of the reniform spot, and not to an insect with "three white dots in the central shade," "with a white crest," and so on. Why German entomologists have referred, and are referring (*teste* Edelsten), specimens to *neurica*, Hb., that do not agree therewith, is a point I do not pretend to be able to understand.

If Schmidt's *neurica* be, as Edelsten submits, a distinct and separate species, then it wants a name, and I would name it *edelsteni* on account of the excellent work which Mr. Edelsten has done in attempting to prove it distinct and separate from our British species, *neurica*, Hb.

The following are the important historical items in the matter:—

1802.—(1) HÜBNER figured our species as *neurica*.

1816.—(2) OCHSENHEIMER writes nothing about the species. He catalogues *neurica*, Hb., only.

1818.—(3) HÜBNER figured the dark aberration of *neurica*.

1825.—(4) TREITSCHKE joined the forms figured by Hübner together as we do, and objected to the supposition that the dark forms were not co-specific with the pale ones.

1858.—(5) SCHMIDT erroneously referred a white-collared, white-spotted upperside, non-spotted underside, form to *neurica*, Hb., and then renamed Hübner's *neurica* and our British *neurica*, *arundineta*.

1869.—(6) More than half a century after Ochsenheimer's death, STAUDINGER says there was in Ochsenheimer's collection (1) a true *neurica*, Hb. (i.e., we take it the species with the black reniform dot encircled with white), labelled "*neurica*, Hb.," in Ochsenheimer's handwriting; (2) a typical *arundineta*, Schmidt, which Ochsenheimer had labelled "*Noctua dissoluta*" (although Ochsenheimer had died years before Treitschke's name appeared), but queried as "*an eadem cum praecedente?*" which it must have been if the first represented *neurica*, Hb., whilst Staudinger noted of Treitschke's examples: "1 is *neurica*, Hb., 381, 2, 3, and 4 are *arundineta*, Schmidt, and 5 is the dark form of *neurica*, Hb., figs. 659-661 = *dissoluta*, Tr., and subsequently *hessii*, Bdv.," all three of which Treitschke considered as one species, as we do. Staudinger, then, refers to one of Ochsenheimer's specimens as "*a true neurica*, Hb., fig. 381," and to one of Treitschke's as "*neurica*, Hb., fig. 381," and to another as the "*dark form of neurica*, Hb., figs. 659-661," which is logical enough; this same "*dark form of neurica*, Hb., figs. 659-661," he recognises, was named *dissoluta*, by Treitschke, and yet he later affirms that it must be "*retained only for the dark form of arundineta*, Schmidt," i.e., Hubner's figs. 659-661 are:—

(1) A dark var. of *neurica*.

(2) A dark form of *arundineta*.

Therefore, according to Euclid, *neurica* = *arundineta*. [This is what Staudinger says, what he meant to say, I do not know. What he thought was clear, viz., that there were two species mixed up which "his friend, Schmidt, so well distinguished." All this argument of Staudinger's leads nowhere, and is beside the question—neither Ochsenheimer, nor Treitschke, dealt with two species—Schmidt did. Therefore it is to Schmidt we come, and it is clear that Staudinger's attempt to deal with the matter was to support Schmidt in the establishment of a new species, which he had to sell, and which was on the market at the time. Personally, he only knew what Schmidt told him, and what he could see from the specimens he had from various places. This we can do just as well to-day, 100 years after Hübner's death, as he could 50 years after, rather better, perhaps, as present-day collections are larger.]

1888-1891.—(7) TUTT, basing his opinions largely on British material and the original descriptions and figures, concluded that Hübner's *neurica*, Hb., figs. 381, 659-661, and Schmidt's *arundineta* are referable to one species, viz., the one we get in Britain. He only deals with *neurica*, Schmidt, so far as Schmidt himself says, that *neurica*, Schmidt = *neurica*, Hb.

1907.—(8) EDELSTEN. The conclusions formulated turn entirely on Schmidt's insects, and the insects that the German collectors are now selling as referable to Schmidt's. If Edelsten's diagnoses of the two forms are right, then it is clear that Schmidt was wrong in referring *neurica*, Hb., 381, to his new species, "without any marks on underside," "with three white dots along median line of wing," "with white collar." [I do not personally know Schmidt's insect (except *teste* Edelsten, who showed me one he vouches is referable thereto), Edelsten does; therefore, I take it, Edelsten's conclusions, following those of Schmidt, give us two allied species, of which we only get one in England, viz., *neurica*, Hb. = *arundineta*, Schmidt. We cannot have two "*neuricas*" in the same genus, hence I name the more recently-named one *edelsteni*.]

Note on *Nonagria neurica*, Hb.

By H. M. EDELSTEN, F.E.S.

Mr. Tutt kindly sent me his manuscript of the above so as to give me an opportunity of replying to his criticism of my previous notes on the subject. I do not think it is worth while entering into a controversy over this matter, and I am quite satisfied that my previous remarks are correct. However, the point is this: Mr. Tutt says

Hübner's fig. 381 is identical with our insect. This figure represents a ♂, of which Mr. Tutt made a description, which he compared with ♀ specimens in his collection. (Mr. Tutt's specimens, which are worn, are the ordinary Cambs. form.) Mr. Bowles and I compared our specimens with Hübner's illustration, and, though there was a certain resemblance, we were convinced it was not meant to represent our species, so I wrote to my friend Herr Püngeler, of Aachen, who kindly sent me specimens of *neurica*, Hb., from Prof. Stange and Schmidt, which are absolutely distinct from our species; how then is Mr. Tutt going to get over the fact that the continental entomologists have accepted this species (which Mr. Tutt wants to name after me) as *neurica*, Hb., fig. 381? Surely, considering that they get both species, they should know which is most like Hübner's illustration. Mr. Tutt says the shape of the wings of Hübner's figure suggest a ♀, which I am afraid I do not agree with. We have bred our species by the thousand from different localities, and it is "absolutely distinct" from the other German insect; the difference is much more noticeable than even that between *faricolor* and *pallens*. I quite agree with Mr. Tutt that we have only one species in this country.

Postscript re *Nonagria neurica*, Hb.

By J. W. TUTT, F.E.S.

Mr. Edelsten is quite right. I believe also that his "previous remarks are correct." I believe his conclusions *re* Hübner, fig. 381, are entirely wrong. I also do not wish to enter into a controversy, but when one's published work is criticised one is supposed to meet the criticism or judgment goes by default. In this case it would have been a mistake not to have stated the other side.

The rest of Mr. Edelsten's polite note begs the point at issue. The question is not what he thought, but whether his description of the insect he refers to *neurica*, Hb., agrees with Hübner's fig. 381. We show that Hübner's figure presents none of the three characters he relies on.

Püngeler's specimens—from Stange and Schmidt—are no doubt most interesting. As it was on these that Mr. Edelsten framed his diagnosis, and as this diagnosis disagrees with Hübner's fig. 381, they may be held to settle that *neurica*, Schmidt, Stange, Püngeler, Edelsten, is not *neurica*, Hb., but are *edelsteni*, Tutt.

With regard to the conundrum *re* German entomologists, I should say that they are as much like a flock of sheep as we are, and follow "the man" of the time, and possibly, with two exceptions, had never seen Hübner's figure. Once Schmidt had referred something to *neurica*, Hb., that Staudinger could sell, the German entomologists followed the "types" they bought from Staudinger, and not Hübner's figure. A copy of Hübner costs little short of £100, and is in general use rather less perhaps in Germany than here.

The shape of Hübner's fig. 381 gives a triangular wing, so does ♀ *neurica*, the ♂ is squarer (more *Tortrix*-like).

It is quite possible that *Nonagria neurica* and *N. edelsteni* differ as much as *Leucania favicolor* and *L. pallens*, in fact, it appears clear on Mr. Edelsten's showing that they do so. It is because of his facts bearing this out that we rename one of the forms *edelsteni*.

Melitæa phœbe var. occitanica, Stgr.

By GEORGE WHEELER, M.A., F.E.S.

I feel convinced that Mr. Tutt is mistaken in his notes on this subject (*anteà*, p. 105), not merely on the question of the occurrence of the vars. *occitanica* and *aetheria* in Switzerland, which is a matter of comparatively small moment, but in his main contention with regard to local races. I am satisfied that it is only in a very limited sense that such things can be said to exist at all. There can be no doubt that the dominant forms of many butterflies are different in different localities, and so far they may be called "local races," but it is most unusual for these same forms not to occur as aberrations in localities where some other form is dominant. In the majority of variable species, *i.e.*, those that vary widely and conspicuously, the directions in which variation tends are well-marked and strictly limited, and it often happens that those tendencies are in exactly opposite directions. For instance, in the Erebiids there occur almost universally both the tendency to lose and the tendency to accumulate eyed spots. Numberless other instances will occur to the minds of those who have made any study of variation, and those who have studied it in the field will also be aware that, whilst it frequently happens that some one form is dominant in any given locality, still, other forms proper to widely different localities crop up from time to time as aberrations, and that this is true even of the forms showing diametrically opposite tendencies. For example, the type form of *Erebia gorge* is the dominant form on the western Swiss Alps, with a marked tendency towards the nearly or quite spotless form *erynnis*, whilst the strongly spotted form *triopes* is dominant on the eastern Alps of the Grisons, yet the only example I succeeded in taking on a baddish day last year above Pontresina was of the type form, already leaning towards *erynnis*. Again, *Anthocaris simplonia*, with its dark green mottlings on the underside hindwings, showing but little white and less yellow, is the usual form of the mountains, while the form of the Rhone Valley is the var. *flavidior* with yellow nervures, lightish green mottlings, and large patches of white; yet the very lightest specimen I have ever seen was taken at the far end of the Laquinthal amongst a large number of the typical mountain form, and in the valley one occasionally meets with specimens as dark as the average form of the mountains. It would occupy too much space to work this out at length in the present note, but it would be well worth while to do so. The outcome, however, of my observations and studies on the subject is this:—(1) Variation in certain directions, or more probably in one particular direction is due to atavism. (2) Variation in the opposite direction, and probably in various others, is due to an inherent tendency in each species, and is the expression of the direction in which new species will ultimately arise as modified descendants of those at present existing, though, of course, great numbers of such incipient species will never succeed in establishing themselves. A further indication of this inherent tendency is to be found in the fact, pointed out long ago by Darwin, that allied species tend to vary in the same manner. This again ought to be thoroughly worked out, but it must suffice for the moment to point out, that, though this similar variation in *one* direction is doubtless atavistic, variation in

the opposite direction obviously cannot be so also, and nothing but such inherent tendencies as I have suggested would seem to account for the facts.

With regard to the particular species under discussion, a difficulty arises as to the precise Spanish form which Staudinger had in view when he named the var. *occitanica*. I have been carefully through the whole material at the Natural History Museum, and can find nothing which would in any way justify the expression "local race" as applied to the forms from any part of Spain except the Pyrenees. The forms from Andalusia and from "Central Spain" are most varied, and with the exception of some small and light specimens from the latter, every form I have seen could be almost exactly matched from Switzerland, and this, on my theory of inherent tendencies, is exactly what one might expect, the dominant form of one locality (or, if the expression must be admitted, the local race) being reproduced as an aberration in other localities where the dominant form is a different one. Except that the var. *aetheria* from South Russia is, as a rule, rather (and occasionally much) larger, the Swiss examples—aberrations again—are indistinguishable. Of these I have taken two, one at Reazzino, where the tendency is towards this form, the other at Martigny, where the tendency is rather in the direction of *occitanica*. With regard to this latter, there is no Swiss specimen among Mr. Tutt's which I should have called by this name; I have only four in my own collection, three of them, all ♀s, being from the Pfynwald, the fourth, a ♂, which I should regard only as closely approaching this form, being from Martigny. If this name was applied by Staudinger to the small light-coloured form which appears in "Central Spain," though by no means to the exclusion of other forms, then I am in error in applying it to my Swiss specimens, but then also the expression "*magis variegata*" is quite erroneous; otherwise, I think, I have applied it correctly. There is no need for a varietal name for the usual Swiss Alpine form, as it is that which most nearly resembles the ♀ figured by Knoch, though his colouring is really much too dull for any form of *phoebe*, and not quite so varied as is usual in the Rhone Valley and its lateral valleys, *e.g.*, on the north side of the Simplon. The statement quoted by Mr. Tutt from my *Butterflies of Switzerland* as to *occitanica* on the south side of the Pass was taken from Favre's *Lépidoptères du Valais*, and was referred to him in the page quoted; the specimens which I have myself taken near Iselle are of a very different description, and run somewhat in the direction of *caucasica*. The one point which I wish to emphasise is my conviction that we are *right* to use the varietal name for specimens of the same form occurring as aberrations in localities where another form is dominant, which, far from causing confusion, affords a real clue to one factor in evolution; and further, to record my strong suspicion that the expression "local race" is a snare and a delusion, as it is apt to imply more than is supported by facts, which I believe only justify us in stating that certain forms are dominant in certain localities, but are always liable to turn up as aberrations in localities where the dominant form is different.

By the way, are we correct in ascribing the name *phoebe* to Knoch (1781)? He was the first to *figure* it under this name, but he refers to Göze, *Beitrag*, iii., p. 365 (1779), and both he and Göze refer to

Schiffermüller, *S.V. Schmetterlinge der Wiener gegend, 1776*, and quote his description, which, however, might perhaps have referred equally to *didyma*.

Melitæa phœbe and its variation.

By J. W. TUTT, F.E.S.

Mr. Wheeler's hypothesis that "only in a very limited sense can local races of lepidoptera be said to exist at all" involves a great deal more than can be dealt with in a magazine article. It suffices that in his next paragraph he adds "there can be no doubt that the dominant forms of many butterflies are different in different localities." It is also quite true that, within the geographical limits of abundance of a species, any of the main races, which may be assumed to be the accumulated result of local environment, may occur in a not very different form, under some specific and not easily detected conditions, elsewhere as an aberration, *e.g.*, a form resembling *occitanica*, or one resembling *aetherea*, may very conceivably occur as an aberration among the more characteristic alpine form we know so well from Switzerland. Mr. Wheeler's contention is largely what I have many times asserted in print, that the inherent possibility of an insect's aberrational variation lies between the extremes in colour and marking of the most divergent forms in all or any part of its range. But even granting this, do *occitanica*, Staudinger, and *aetherea*, Evers., occur in Switzerland? We must remember that, if Staudinger were asked to forward typical *M. phoebe*, at a few pence each, he almost invariably forwarded specimens from the Rhone and its lateral valleys (at least, he did so twice to the writer), and the range of variation in Switzerland must have been well-known to him. One, therefore, doubts whether he would have named the Russian and Spanish forms had they not been quite separate from those he already knew. Mr. Wheeler says that *aetherea* and *occitanica* occur in Switzerland; so far the matter appears settled; but what are the exact characters on which one relies for the names of these insects? In other words, we want a settlement of Staudinger's *occitanica* and Eversmann's *aetherea*. One supposes that the "Staudinger collection" may still retain the type of the former.

An exhibition of Lepidoptera held by the Société lépidoptérologique de Genève at Geneva.

By PROFESSOR C. BLACHIER.

This exhibition was held in the Great Hall of the National Institute of Geneva from April 25th to May 5th, and proved a brilliant success, drawing not only entomologists from Geneva and elsewhere, but naturalists professing other branches of study, as well as attracting many quite outsiders. Never before has Geneva had such a beautiful exhibition, and the splendour of the butterflies has, no doubt, been quite a revelation to many. The hall was excellently arranged and lighted from above. In the centre, two long tables, slightly inclined, were reserved for Palearctic butterflies, whilst around the hall were other tables bearing glass drawers and boxes containing exotic species. At one end some separate tables were utilised for biologic exhibits, others for collecting apparatus, for rearing larvæ, and for the conser-

vation of specimens. Lastly, there were exhibits of living larvæ. Among the many exhibitors were:—

Mr. Morton (Lausanne)—a fine collection of *Ornithoptera*, among others, *O. paradisea*, *O. victorise*, *O. meridionalis*, *O. chimaera* ♂ and ♀, etc.

Colonel Agassiz (Lausanne)—many choice aberrations, amongst others (1) *Papilio machaon* with the marginal lunules of the four wings almost absent, and invaded by black; Silesia. (2) *Parnassius apollo*, from the Bernese Jura, three red ocelli on forewings and four on hindwings, two at anal angle; all the ocelli being joined across the wings with a dark band of black scales. (3) *Limenitis camilla* ab. *reducta* (Silesia), and ab. *pythonissa* (Silesia). (4) *Pyrameis atalanta* ab. *elymene* (temp. exper.). (5) *P. cardui* ab. *elymi*, from Java; the hindwings rounded. (6) *Aglais urticae*, ground colour orange-yellow (temp. exper.). (7) *Melitaea cinxia*, *M. athalia*, *M. dictynna*, *Brenthis selene*, melanic examples. (8) *Brenthis daphne*, ♂ and ♀, with the black points of the two antemarginal rows confluent in the form of haltères. It is very similar to that figured by Aigner-Abafi (*Ann. Mus. Nat. Hung.*, 1906, p. 503)=ab. *conjuncta*, Tutt=ab. *obscura*, Aigner (?). (9) *Epinephele pasiphae*, from Algeria, the fulvous replaced by cream. (10) *Eugonia xanthomelas* ab. *chelys* and ab. *gritzneri*; *Polygonia c-album*, etc. (11) *Agriades corydon* ab. *semibrunnea*, from the Bernese Juras. (12) *Lycaena arion* ab. *unicolor* (?), the black points of the four wings very reduced, the ground colour of a beautiful dark blue; it is like that figured by Oberthür (*Etudes*, xx., pl. iii., fig. 19); var. *ligurica*, from Mentone. (13) *Celastrina argiolus* ab. *subtus-radiata*, the hindwings with the black streaks distinctly more thick than in that figured in *Nat. Hist. Brit. Butts.*, ii., pl. xviii., fig. 10. Among the moths the genera *Arctia*, *Catocala*, and *Plusia* were shown. A specimen of *Euchelia jacobaeae*, with the carmine replaced by yellow, was noted.

Mr. Vaucher exhibited 16 drawers of Asiatic Parnassids, including all the known species.

Mr. Drexler, specimens representing 22 geographical races of *Papilio machaon*, from districts extending from England through Europe and Asia to Japan. Also a drawer of curious aberrations of this species, the result of "high" and "low" temperature experiments.

Mr. Mongenet, the Anthrocerids of Geneva, including varied series of *Anthrocera carniolica* with ab. *jurassica*, ab. *ragonoti*, etc.; *Anthrocera fausta* var. *jucunda*, including ab. *segregata* and ab. *pygmaeoides*.

Mr. Jullien—(1) 24 micro-photographs of the genital organs of 14 Argynnid species. (2) Comparative life-histories of *Melitaea deione*, *M. berisalensis*, *M. athalia*, etc.

Mr. Pictet—(I) a long series of *Lasiocampa quercus* var. *sicula* reared in Geneva, grouped in two sections—(1) Normal, the duration of the pupal stage about two months. (2) Darker, the pupal stage lengthened artificially to five months. The experiment tended to show that "an extension of the pupal stage might be sometimes a factor in melano-chroism." (II) A box containing abnormal *Aglais urticae*, *Vanessa io*, *Eugonia polychloros*, with a note that "pupæ submitted to a temperature of 50° to 60°, gave rise to imagines with the markings strongly modified." (III) Series of *Vanessa io*, with a note

that "Humidity and heat sometimes produce the same variation, both may be factors in inducing partial melanism." (IV) Box of *Ocneria dispar*, with two series—(1) ♂ and ♀ small, very pale, ill-marked; (2) ♂ and ♀ large, ♂s very dark, markings well-developed. A note stated that "abundant food, but poor in nutritive elements, is a factor of weakness and albinism; food rich in nutritive elements is a factor of vigour and melanism." (V) Box of *Abraex grossulariata*, tending to show that sometimes the results of poor food are not noticeable until after two generations.

Professor Reverdin exhibited—(I) Three drawers of malformations of lepidoptera arranged as (1) Malformation of wings. (2) Malformation of nervures. (3) Asymmetry in antennæ. (II) Series of *Pieris brassicae*, the pupæ of which had been exposed to Röntgen rays—the apical spot in the spring generation grey in both sexes, instead of the normal black; the discal spots of the ♀ are, on the contrary, as black as in the type; in the summer brood no modification in pigmentation was obtained; the duration of exposure to the Röntgen rays extended from a minimum of 20 to a maximum of 95 minutes. (III) *Aglais urticae*, pupæ also exposed to the Röntgen rays; in six examples subjected from 20-45 minutes, the blue marginal spots had disappeared and were replaced by black; the other examples, treated similarly, were normal. (IV) 250 *Erebia tyndarus*, differing greatly in ocellation; this series forms the material of a paper appearing in the *Bull. de la Soc. Lép. de Genève*, fasc. 3.

Dr. Denso, who recently bought Austaut's collection, exhibited—(I) A marvellously interesting and variable series of Sphingids, including *Hyles euphorbiae*, with its forms *dahlia*, *tithymali*, *mauretanica*, *deserticola*, *robertsi*, *siehi*, and its ab. *privata*; *H. nicaea*, with its vars. *orientalis*, *castissima*, *carnea*, etc.; fine series of *Turneria hippophaes*, *Thaumas respertilio* with its vars. *flava* and *murina*, etc. A drawer of *Amorpha populi* var. *austauti*, and its abs. *incarnata*, *staudingeri*, and *mirabilis*. (II) Many interesting named hybrids and mongrel Amorphids and Phryxids, with the parents of the hybrids, preserved larvæ, pupæ, etc., and 50 coloured figures of the larvæ at various ages.

Mr. Rehfoos exhibited 22 species of Lycænids taken near Geneva, among others the immigrant *Raywardia telicannus*, *Lampides boeticus*, and (for this district) *Aricia eumedon*. The most remarkable aberrations are (1) ♀ *Agriades bellargus* ab. *ceronus* with the forewings blue, the marginal border greyish-ashy tint, and with a series of fulvous lunules on the hindwings. (2) ♀ *A. bellargus* without spots on the underside of the forewings. (3) ♀ *A. corydon* without spots on the underside of the hindwings, and a single series of large spots in a straight line on the forewings. (4) ♂ *Nomiades cyllarus* with only three spots on the underside of the forewings, and none on the underside of the hindwings. (5) A fine series of *Hesperia malvae* ab. *taras* from Mt. Salève, etc.

Professor Blachier, 50 drawers of Palæarctic and Exotic lepidoptera. A particularly fine series of *Parnassius apollo* taken on Mt. Chasseral in the Neuchâtel Jura, July, 1907, the race being remarkable for the size of its ocellated spots, and the intensity of the red colour, particularly on the underside; Fruhstorfer has (*Soc. Ent.*, 1906, p. 137) named it var. *nivatus*, a name which the exhibitor thought might be applied to all the Jura examples. Among these was a perfect symmetrical gynandromorph, right side ♂, left side ♀, the

body above appeared to be divided along its axis in two parts, belonging to the respective sexes; on the right side the thorax and abdomen are covered with the greenish villosity characteristic of the ♂, on the left the thorax is brownish and the abdomen almost glabrous, blackish, with each segment bordered with a pale line as in the ♀. Also a series of *P. apollo* captured at Eclépens in July, 1907, of a beautiful ivory-white, the ♀s frequently with the black spots of the forewings marked with red (=ab. *pseudonomion*) also the two anal spots (=ab. *decora*). Fruhstorfer has compared the ivory colour of these with the form *melliculus* from Bavaria.

Mr. Culot exhibited fine bred exotic Attacids. Mr. Mazel, exotic Sphingids, Nymphalids, and Chalcosiids. Mr. Helle, African lepidoptera. Mr. Lacreuzé, Swiss lepidoptera, including *Parnassius apollo* ab. *rufa* from Gex, and a ♀ *Polyommatus icarus*, with triangular black streaks resting on the inside of the orange lunules and pointing towards the base of the wing.

The larval habits of *Adkinia graphodactyla* var. *pneumonantes* in spring, just previous to pupation.

By J. W. TUTT, F.E.S.

The light that Dr. Chapman was able to shed on the habits of the spring brood of the larva of *Adkinia graphodactyla* var. *pneumonantes*, detailed at length in *The Nat. Hist. British Lepidoptera*, v., pp. 524-5, left it quite clear that many of the notes recorded by Freyer, Frey, and Zeller only doubtfully belonged to this species, and, at the same time, left no uncertainty as to the hibernating habit of the larva in the root (or shoots immediately springing therefrom) of *Gentiana pneumonanthe*. It left involved, however, the whereabouts of the spring larva, and its habit after hibernation was over. I, therefore, urged Mr. Gillmer to get me, if possible, some plants of *Gentiana pneumonanthe*, and this he did, and, on May 12th I received some plants from him, carefully packed, and which I was instructed to pot as soon as received. This I did, and the plants seemed to thrive up to a point, though not altogether happy. It was evident that the central portions of the plants were much eaten, but a series of side shoots were making fair progress. As, however, I wanted to know what the larvæ would do, I did not disturb them much. They made no real external sign until about the 22nd, when a fine green larva was seen, evidently nearly fullfed. The central area of the plant on the ground level was now seen to be somewhat brown and discoloured, but the larva left the plant on which it had been feeding, settled down on a grass-stem some four inches above the ground, and soon its swollen thorax and outstanding (apparently knobbed) setæ gave indication that pupation would soon take place; this happened on the 24th, by which time another larva on another plant was observed; this also selected a grass-stem on which to spin up, and on the 27th this was also showing the usual modification observed in shape, etc., in the quiescent stage preceding pupation, and on the 28th had pupated; a larva also was apparent on the last (third) plant, and as this was already fixed on a grass-stem and nearing pupation, it is evident that it had been overlooked the preceding day. On the evening of the 28th, two more larvæ were observed on this plant both settled on grass-culms, but with the thoracic areas not yet swollen, so that there could be no doubt that it was the habit of

the larva to leave the foodplant and attach itself externally to a neighbouring grass-culm. On the morning of the 29th the most advanced larva of this plant had pupated, and a fourth larva had made its appearance, this one resting lengthwise on one of the lateral stems of the gentian. The work of the larva on the plant reminded one almost exactly of that of *Adkinia bipunctidactyla* on *Scabiosa*, the same external evidence, but to a less extent, of the larval ravages in the main or large lateral shoots, the destruction of any central shoot, and the growth of the plant by means of lateral shoots which appeared to be little affected by the larval attacks on the main part of the plant. The most remarkable fact appeared to be the absence of any appreciably hard prothoracic larval plate, suggesting boring-habits. From the very first time of its external appearance, the larva had none of the characters of the prothorax that one generally attaches to a boring larva, and the pellucid green colour, the stiff setæ, the head and prothorax unicolorous with the body, all surprisingly suggested an external- rather than an internal-feeding larva, and it is probable that later examination of the plant may show that the spring-used cavity allows quite free movement without friction, and even the putting of the head outside among the green shoots to feed. It is to be noted that, though, so far, two of the plants have only given up one larva each, the fact that the third plant has produced four, proves absolutely that, in nature, several larvæ may feed in one plant. The larvæ settle down for pupation almost at once on becoming external, and do not wander more than a few inches at most; they rest head downwards, and spin the anal pad in such a manner that pupation appears always to occur with the larva in this position. The pupæ, therefore, always hang head downwards; usually they appear to be well attached by both portions of the cremaster, as described in *Nat. Hist. Brit. Lepidoptera*, v., pp. 107-108, and then the larva has some degree of rigidity, although usually the anterior portion stands well away from the surface to which the cremaster is attached, and along which the adult larva took up its resting-position before actual pupation, but, in one case, it hangs free by the hind portion of the cremaster, and has a very Nymphalid appearance in the freedom of its swing, head downwards, but it is quite clear from the structure of the venter between the 8th and 10th abdominal segments, *i.e.*, between the front and hind portions of the cremaster, that this should rest firmly against the attached surface, from which then the blunt-headed pupa protrudes slightly, and with its green tint and faint reddish tinting reminds one much of the two colours seen in all the young and growing shoots of its foodplant now heading-up through the hitherto higher grass by which it is apparently always surrounded, although the pale lines on the wing-cases, and pale lateral lines, are also very effective on a grass-blade. On June 9th another pupa was found on the second plant, and another larva ready to pupate on the third, making eight larvæ from the three plants. By this date the three earliest pupæ had given up their imagines, a fourth emerging on June 10th, another on June 13th, another on June 14th, the pupal period being apparently eleven days.

The parallelism of the habits of the spring larvæ of this species with those of the larvæ of *Adkinia bipunctidactyla*, described at length, *Nat. Hist. British Lepidoptera*, vol. v., pp. 345-346, tallies in all respects with the parallelism fully described (*op. cit.*) in the summer larvæ of

the two species feeding on the flowers of their respective foodplants. So far as we have got, a similar parallelism occurs in *Adkinia zophodactylus*, but with regard to the latter, we still await exact observations as to how the spring larva of this species disports itself from the time it re-commences to feed until pupation, in fact, from the time the autumn eggs are laid right through winter and spring until pupation. We have a splendid account from various observers of the flower-feeding summer larvæ in more than one brood (*Nat. Hist. Brit. Lep.*, v., pp. 322-325), but of the winter boring larvæ we know practically nothing, and still await the careful observer who is to tell us, we hope, in the immediate future.

A recent note from Mr. Gillmer (written May 24th, 1908) states that, on May 20th, he found larvæ of *Adkinia* var. *pneumonanthæ* on *Gentiana pneumonanthe*, that they become external on the food-plant about the middle of May, and feed on the apex of the plant. The earliest larva pupated May 23rd, and the earliest imago emerged on June 3rd.

The last larva observed by us had pupated by June 11th, by which date four imagines had, as previously noted, already appeared. The imago from this last pupa emerged on June 23rd. The pupal stage of this brood is, therefore, a very short one.

This addition to our knowledge of the life-history of the winter brood of *Adkinia graphodactyla* opens up, so far, new ground, and we would suggest that a copy of these pages should be carefully fastened so as to face page 529, in volume v, of *The Natural History of British Lepidoptera* (vol. i, *Nat. Hist. of British Alucitides*).

Butterflies in the Pyrenees in 1907.

By J. N. KEYNES, M.A., D.Sc., F.E.S., and G. L. KEYNES.

The following are some extracts from our entomological diary for about four weeks, which we spent in the French Pyrenees in June and July, 1907. For the first week we were in the Eastern Pyrenees at Vernet-les-Bains, an excellent entomological centre; we then moved westward, our headquarters being, successively, Bagnères de Luchon, Cauterets, Gavarnie, and Biarritz. At Vernet the weather was fine, and it was exceedingly hot; afterwards the weather was very broken, and at Cauterets we practically had no sunshine at all. The season, entomologically and otherwise, was a late one, and the snow was lying thick at much lower altitudes than is usual in the early summer.

June 16th.—Vernet to Casteil and the Monastery of St. Martin. The sky was cloudless, and it was very hot, notwithstanding a fairly strong breeze. On this one day we recognised more than fifty different species. The insects, speaking generally, were wild and difficult to catch, and this continued to be the case throughout our stay at Vernet. The only skipper that we noticed was *Hesperia carthami*. Amongst the "blues" were *Nomiades cyllarus*, *Scolitantides baton*, *S. orion*, and *Everes argiades* var. *coretas*. These, with the exception of *S. baton*, were getting over; but while at Vernet we took good specimens of all of them. Other blues were *Cyaniris semiargus*, *Polyommatus alexis*, and *Aricia astrarche*. *Papilio podalirius* var. *feisthamelii* was flying freely and in excellent condition. This butterfly and *Aporia crataegi* were the insects most in evidence, if not absolutely the most common, at Vernet. We took *Parnassius apollo* and

P. mnemosyne, both in good condition. *Euchloë euphenoides*, usually a rather dark form, was plentiful and very active, and we took, while at Vernet, a good series both of ♂s and ♀s, though the former were getting over, so that we had to pick our specimens. *Melitaea cinxia* was fairly common, but rather worn. We took specimens of *M. deione*. Care was required in distinguishing this species from *M. parthenie* and *M. athalia* (a large form), which were also to be met with. *Limenitis camilla* was in good condition and very large. *Coenonympha arcania* was common, as in most of the other places that we visited in the Pyrenees. The only Erebiid taken was a single *Erebia evias*, in fresh condition.

June 17th.—Valley of St. Vincent, weather unchanged. To-day, in addition to *Hesperia carthami*, we met with *Powellia sao*. The "blues" were much the same as yesterday, with the addition of *Cupido minimus*, *Polyommatus bellargus*, and *P. escheri*. *C. minimus* is spoken of by Mr. Elwes as rare in the Pyrenees; in our experience, however, it was fairly common nearly everywhere. Of Theclids we took to-day *Thecla ilicis* and *T. acaciae*, both very fresh. All the specimens of the former that we met with at Vernet were ab. *cerri*. Mr. Rowland-Brown, who was at Vernet in July, states that he did not notice any examples of ab. *cerri*. This may point to two broods, ab. *cerri* being more frequent in the earlier one. Rather unexpectedly, as we thought the species would be over, we took a specimen (the only one we saw) of *Thais rumina* var. *medesicaste* in excellent condition. *Euchloë euphenoides* was again plentiful, also *E. cardamines*, but in less good condition. Amongst the Melitæas were *Melitaea phoebe* and *M. didyma*. We also took *Pararge maera* var. *advasta* and *P. egeria* (type), both in fine condition.

June 18th.—Weather still very fine. We spent most of to-day on a steep bank, within the hotel grounds, on the left side of the stream flowing through Vernet. Here we found *Scolitantides orion* more plentiful than on the two preceding days, and in better condition. After some search we also hit upon the right place for *Laeosopsis roboris*. The insect was not yet plentiful, but by the exercise of some patience we secured a fine series in absolutely fresh condition. Previously, we had seen only bred specimens of this species, and these were not much more than half the size of the ones we took to-day. In the afternoon we found a spot just above the winter garden where *Thecla acaciae* was plentiful and very fine. In the same place we took *Epinephele jurtina* var. *hispulla*.

June 19th.—To Casteil and then on to the Tower of Goa. Another brilliant day. The heat was great, and we suffered very much from thirst. Quite near the Tower of Goa, *Papilio podalirius* var. *feisthamelii* were fighting in hundreds, a wonderful sight. A very brilliant form of *Chrysophanus alciphron* var. *gordius* was plentiful, and *Scolitantides baton* occurred in some numbers. To the "skippers" we had previously taken were added *Erynnis alcaeeae*, *Hesperia serratulæ*, and *H. malvae*. Amongst the "blues" were *Polyommatus amanda* and *P. hylas*. *Thecla acaciae* was met with quite high up, near the Tower of Goa. The Erebias were *Erebia stygne* and *E. evias*, two species which it needs some little experience to distinguish from one another, though the underside hindwing is a sure guide. We took a single specimen of *Melanargia lachesis*, the first of this species that we had

seen; a week or so later it would no doubt be very plentiful at Vernet. Amongst other species taken to-day were *Nemeobius lucina*, *Pontia daplidice*, and *Colias edusa* ab. ♀ *helice*; but none of these were in good condition.

June 20th.—Another day of bright sunshine. In the morning we again visited the hot corner where we had taken *Laeosopis roboris*, and added to our series of this insect. One of us spent nearly an hour in pursuit of a specimen of *Epinephele pasiphaë*, which kept returning to the same shady place amongst brushwood, and consequently always avoided capture. We took a second specimen of *Melanargia lachesis*.

June 21st.—One of us, having slept at the Chalet Hotel of the Canigou, climbed this mountain in the morning and made some captures during the descent. These included *Thecla ilicis* ab. *cerri*, *T. acaciae*, *Parnassius mnemosyne*, *Melitaea deione*, and *Erebia evias*. The one of us who remained at Vernet returned to the pursuit of *Epinephele pasiphaë*, and this time with success. It was an absolutely fresh specimen, no doubt the forerunner of many more to come. Amongst other captures were two very large *Erynnis althaeae*, both ♀ s, *Celastrina argiolus*, *Melitaea dictynna* ♀ (a light type), and two *Melanargia lachesis*. There was some cloud and a little rain in the morning, and a thunderstorm in the evening.

June 22nd.—We left Vernet in torrents of rain. The disturbances in connection with the wine trade in the south of France were at their height, and some of the towns through which we passed to-day, e.g., Narbonne and Perpignan, were almost in a state of siege. We stayed the night at Carcassonne, and went on next day to Luchon.

June 24th.—Lac d'Oo. Sunshine for about an hour only, and no captures of any interest.

June 25th.—Vallée du Lys. A fine day. Amongst the insects that we took were *Erynnis althaeae*, *Cyaniris semiargus*, *Polyommatus bellargus* ab. ♀ *ceronus*, *Pontia daplidice* var. *bellidice* (in good condition, but flying with extraordinary rapidity so as to be difficult of capture), *Melitaea athalia*, *M. dictynna*, *Polygonia c-album*, *Pararge maera* var. *adrasta*, *Coenonympha arcania*, *Erebia stygne*, and *E. evias*. But our most interesting captures were two fine specimens of *Polyommatus corydon* var. *corydonius*, a variety which we have not seen previously recorded from the French Pyrenees. The colour of this butterfly on the upperside is quite different from the type, approaching that of *bellargus*, though the underside is typically *corydon*. At first, indeed, we took it for a variety of *P. bellargus*, which was common everywhere. There was not a single specimen of *corydon* (type) to be seen here, nor did we meet with it elsewhere in the Pyrenees.

June 26th.—To-day we took a walk into Spain by the Port de Vénasque, and the capturing of butterflies was a rather secondary consideration. Above the Hospice de France, *Pararge hiera* was flying in some abundance, and higher up, at about 7000 feet, we took some fine and very fresh specimens of *Erebia lappona* var. *sthennyo*. At something over 7000 feet we also captured a particularly fine *Colias edusa* and two *Pontia callidice*. The day ended in a heavy thunderstorm.

June 27th.—We spent the morning above the Hospice de France on the way to the Port de la Piquade, and found it a very good hunting-ground. The height above sea-level was something over 4500

feet. At midday it clouded over, and there was a good deal of thunder. We found *Nomiades cyllarus* abundant, and in much fresher condition than at Vernet. *Polyommatus escheri* was not uncommon, the specimens being small and bright, with the marginal spots well developed; in colour they differed from the specimens that we have taken in Switzerland. *Melitaea aurinia*, smaller and rather darker than the ordinary lowland form, was very much in evidence. The *Erebias* were in greater variety than elsewhere, and included *E. epiphron* var. *cassiope* and var. *pyrenaica*, *E. oeme*, *E. stygne*, and *E. erias*. Of these, *E. oeme* was the commonest.

June 28th.—From Luchon to Cauterets, where we stayed till July 3rd, when we went on to Gavarnie. During the whole time we were at Cauterets the sun did not shine for more than two or three hours, and we saw hardly any butterflies.

July 4th.—A fine day, until the evening. In the morning we walked to the famous Cirque de Gavarnie. There were not many butterflies on the wing, but we took some very fresh *Erynnis laraterae*, which, throughout our stay at Gavarnie, we found fairly common, though—as usual—not very easy to capture. All the specimens were smaller and darker than those we have taken in Switzerland. Our only other capture of interest this morning was *Erebia tyndarus* var. *dromus*, and this also was in very fresh condition. While at Gavarnie we took only three specimens of this insect. It was evidently only just emerging, and would probably be common later on. In the afternoon, on the way to the Gave d'Ossoue, we took in the same field *Chrysophanus hippothoe*, ♀ type, and ♀ var. *eurybia*, the former in very good condition, the latter much worn.

July 5th.—Vallée de Poueyespée. Our most interesting capture to-day was a freshly-emerged specimen of *Lycaena orbitulus*, the only one we saw while at Gavarnie. Unfortunately, we were too early for this butterfly, and also for *L. pyrenaica*. The specimen we took was evidently var. *oberthüri*, the ground colour of the wings being deeper than in the type. In other respects, however, it does not correspond with the interesting description of this variety given by Mr. Rowland-Brown in the *Entomologist* for October, 1905. The discoidal spot on the upperside of the hindwings is not more definite than in the type, and the costal spot on the underside is ocellated. One of us, walking on to the Port d'Espagne and beyond, saw a number of specimens of *Erebia lefebrei*, but, unfortunately, the day not being very promising, he had left his net behind. They were very shy, and flew over steep and loose shale, so that in any case it would have been most difficult to capture them; but it was disappointing not to be able to make the attempt. We should have gone again to the same place, but there was no more sunshine while we were at Gavarnie.

The *Melitæas* that we met with at Gavarnie were *M. parthenie* and *M. dictynna*, the latter a peculiar light form, with the black spots on the underside of the hindwings very small or even absent. Perhaps the commonest butterfly was *Erebia stygne*, and it was in beautiful condition; the form was large, with the red band pronounced, and the ocellations large and numerous.

As already stated, we had no more good weather at Gavarnie, and on July 8th we went on to Biarritz.

July 9th and 10th.—We spent the mornings of these two days in

the neighbourhood of the Lac de Mouriscot, which appeared to be the best hunting-ground near Biarritz. The first day was very fine, but on the second day it was cloudy nearly the whole time. We had hoped to take a good series of *Heteropterus morpheus*, but we came across only one specimen of this curious butterfly. This was a ♂, and we took it in a hedge at some height above the swamp where we had been led to expect the ♂s. Probably we were too early for this insect. Another skipper taken on these two days was *Thymelicus acteon*, and this was plentiful. Of coppers, the only species met with was *Loweia dorilis*. By far the commonest blue was *Plebeius argus (aegon)*, a fine form with richly marked undersides. *Everes argiades* (type) was fairly common, and in very good condition. We succeeded in taking only three or four specimens of *Lampides boeticus*. Some of these were worn, so that it hardly looked as if in this case we were too early. *Thecla ilicis* (type) was abundant, but worn. The only other Theclid we saw was a single specimen of *Bithys quercus*. We took a remarkably white specimen of *Colias edusa* ab. *helice*, even the orange spots on the hindwing being bleached, but it was in very poor condition. *Coenonympha arcania* was common, and we took a short series of *C. oedipus* among the reeds. Our captures were very fine specimens, and they were perfectly fresh, though one or two had their wings cut by the reeds. It took us a good many hours to secure even this short series, and we have no doubt that this was again a case in which, in consequence of the lateness of the entomological season, we should have been more successful had we arrived on the scene a little later.

Notwithstanding the lateness of the season which was against us at Gavarnie and Biarritz, and the unfavourable weather which we met with at Caunterets, and to a less extent at other places, our holiday was, on the whole, very satisfactory entomologically, as well as from other points of view, into which we need not now enter. It has been a source of much interest to compare Pyrenean specimens with specimens of the same species previously taken in Switzerland, and we took a fair number of species and varieties that were new to us, notably:—*Heteropterus morpheus*, *Polyommatus corydon* var. *corydonius*, *P. orbitalis* var. *oberthürri*, *Scolitantides orion*, *Everes argiades* (type), *Lampides boeticus*, *Laeosopis roboris*, *Papilio podalirius* var. *feisthamelii*, *Thais rumina* var. *medesicaste*, *Pontia daplidice* var. *bellidice*, *Euchloë euphenoides*, *Melitaea deione*, *Pararge maera* var. *adrasta*, *P. egeria* (type), *Epinephele jurtina* var. *hispulla*, *E. pasiphaë*, *Coenonympha oedipus*, *Erebia epiphron* var. *pyrenaica*, *E. evias*, *E. lappona* var. *sthenno*, and *Melanargia lachesis*. We give this list, as it may be interesting to entomologists who, like ourselves in previous years, have confined their attention mainly to Switzerland.

The Natural History of British Butterflies, Vols. I and II.*

By G. T. BETHUNE-BAKER, F.Z.S., F.E.S., &c.

We take up the completed volume ix of the *British Lepidoptera* with the mental reservation "Of the making of many books there is

* *A Natural History of British Butterflies, their world-wide Variation and Geographical Distribution*, by J. W. Tutt, F.E.S., Vol. i., pp. i-iv. and 1-479, pls. i-xx.; Vol. ii., pp. i-x. and 1-495, pls. i-xxviii. [Elliot Stock, 62, Paternoster Row, E.C. Price £1 1s. each volume net.]

no end," and we arrive at its last page, 494, with an expressed assertion to the truth of the completion of our quotation, "and much reading is a weariness to the flesh." But as we think over the fulness of information brought together in the volume we wonder where we have arrived; and in asking ourselves also the question, whither goest thou? one of Ruskin's epigrammatic sentences forces itself on our mind: "Man is the sun of the world; more than the real sun. The fire of his wonderful heart is the only light and heat worth gauge or measure Let him stand in his due relation to other creatures, and to inanimate things—*know them all and love them*, as made for him, and he for them; and he becomes himself the greatest and holiest of them."

So with this thought in our view, we propose to try and find out the point to which Mr. Tutt and his collaborators have brought us. The volume in question deals solely with certain species which used to be known as the *Theclidae* and *Lycaenidae*, the latter in its more comprehensive form including the whole super-groups, *i.e.*, the Coppers, Hairstreaks, and Blues. Hereafter the old names are to be dropped, to be replaced to a large extent by still older names, but names that will be new to the majority of students in this group of butterflies. Personally the writer feels a deep debt of gratitude to the Editor, in that old historic names have been so excellently unravelled, and genera and types have been fixed in very many cases; for this unravelling has made it possible for him to continue a generic revision of the whole Palaearctic group, the material for which he has had prepared for many years, but it has been laid aside long ago on account of the single fact that time and opportunity to go into the details of the synonymy and early literature were not available. To enable us to deal with the matter we must refer to the "coppers," whose history is detailed in the closing portion of volume viii, where also the main history of the synonymy is considered.

Primarily the name *Lycaenidae* is practically to drop from our vocabulary and is to be replaced by *Ruralidae*. We have already almost got accustomed to it, and for ourselves we do not find these changes of names as confusing as expected, but there are certain conclusions that we do not see our way to agree with. As, however, we believe the Editor's one view is to advance and to arrive at a point from which others can start and make a further advance in our knowledge of the science, we have no hesitation in referring to the few points where we differ as we go through the volumes. The type of the genus *Heodes*, Dalman, is fixed by the same author in the same year (1816) as *virgaureae*. In 1818 Hübner brings into being the genus *Chrysophanus* for a heterotypical group, but Scudder restricts it in 1875 and fixes the type as *hippotoë*, placing *phlaeas* in a separate genus (*Heodes*, from which he excludes *virgaureae*), whilst in 1906 Tutt describes his genus *Rumicia* solely for our one little "copper" *phlaeas*. We thus arrive at this point:—

Heodes, Dalman, type *virgaureae*, Dalm.

Chrysophanus, Hübner, type *hippotoë*, Linn.

Rumicia, Tutt, type *phlaeas*, Linn.

We have most carefully examined these three species in all their structure, almost with the wish to find divergences, but without success. We cannot separate them generically, therefore we hold that

both *Rumicia* and *Chrysophanus* must sink to *Heodes*, Dalman; we believe that the majority of the Palæarctic species of the true coppers will fall into this genus. The large, open cells characteristic of the ova, and the most beautifully-shaped trumpet-hairs of the pupa, so well shown in Plates iii., x. and xi., are matters of deep interest, and will, we hope, be instrumental in arousing further investigations among students of this brilliant group.

Vol. ix introduces us to the "hairstreaks," beginning with the widely distributed little species *rubi*, Linn.; this is placed in the genus *Callophrys*, Billberg, inasmuch as Hübner's genus *Lycus* was already preoccupied in coleoptera. The life-history as shown on pl. iv. is of real interest and value—only we wish all the ova had been enlarged to the same degree. We see nothing to object to in the subdivision of this section into the three tribes *Callophryidi*, *Strymonidi*, and *Ruralidi*, omitting altogether out of our consideration one section, the *Thesatoridi*—a very natural one—as not coming within the range of this paper, all the species being extra British. The first tribe is represented by the single species already mentioned, the second by *w-album*, Knoch, and *pruni*, Linn., the third by *quercus*, Linn., and *betulae*, Linn. Our author creates the genus *Edwardsia* (afterwards altered to *Chattendenia*, owing to *Edwardsia* being preoccupied) for the species *w-album*, and he rightly refers *pruni* to Hübner's genus *Strymon*; we admit the generic distinction of these two species with serious misgiving, but with the hope, at a later date, of proving the point or admitting it. In like manner we are hardly prepared to admit the validity of several of the genera suggested for Palæarctic species of this section as given on pp. 142 and 143. We now come to the third tribe, consisting of two species, hereafter to be known under the names *Bithys quercus*, Linn., and *Ruralis betulae*, Linn. Superficially by the pattern the genera can be readily separated, structurally, however, it is by no means easy to do so; there are, nevertheless, slight differences in the neururation, and as the types of each were fixed long ago we must admit their validity for the time being, on the evidence of our two British species. Hübner created the genus *Bithys* for a number of species belonging to several genera, of which *quercus* was one, whilst Stephens, in 1835, definitely restricted the genus, that species thus fixing the type. The genus *Ruralis* was brought into existence in reality by Poda in 1761, and was confirmed by Linné in 1767, whilst, in 1781, Barbut definitely confirmed the type already given by Poda as *betulae*.

This brings us to the group *Lycaeninae*, comprising that vast section of "Blues" ranging all over the world except in the Neotropical region. The first species dealt with is *boeticus*, Linn.; it is placed by our author in the genus *Lampides*, Hübner, which was described by that writer for a heterogeneous group of insects of which *boeticus* was one. The name (*Lampides*) was restricted to the species in question by Newman some thirty-eight years ago, and we hold that Tutt's reasoning on the facts before us concerning this synonymy is quite convincing. It appears quite possible that the genus may hereafter be restricted solely to this species.

The last insect to be treated in the volume is our common "Holly Blue, for which our author made the genus *Celastrina* in 1906. Since de Nicéville's work on the Indian *Lycaenidae* this species, with its allies, has very generally been placed under the genus *Cyaniris*,

Dalman; but Dalman gave *argianus* as the type; *argianus*, however, falls to *semiargus*. *Cyaniris* will possibly also fall before *Polyommatus*, and this, in its turn, will probably fall before *Plebeius*, [Linné,] Kluk, for we believe that the great majority of the Palæarctic "Blues" will be placed hereafter in one great comprehensive genus, which may be *Plebeius*, Kluk. In the present state of our data, we, therefore, accept Tutt's genus *Celastrina* for our species *argiolus*, Linn. We therefore arrive at the following classification, so far as it goes:—

Family: RURALIDÆ.

Sub-family: CHRYSOPHANINÆ.

Tribe: CHRYSOPHANIDI.

Genus: *Rumicia*—*R. phlaeas*.

Genus: *Chrysophanus*—*C. dispar*.

[N.B.—Both these genera should fall to *Heodes*.]

Sub-family: RURALINÆ (formerly THECLINÆ).

Tribe: CALLOPHRYIDI.

Genus: *Callophrys*—*C. rubi*.

Tribe: STRYMONIDI.

Genus: *Chattendenia* (*Edwardsia*)—*C. (E.) w-album*.

Genus: *Strymon*—*S. pruni*.

Tribe: RURALIDI.

Genus: *Bithys*—*B. quercus*.

Genus: *Ruralis*—*R. betulae*.

Sub-family: LYCÆNINÆ.

Tribe: LAMPIDIDI.

Genus: *Lampides*—*L. boeticus*.

Tribe: CELASTRINIDI.

Genus: *Celastrina*—*C. argiolus*.

One of the most valuable features of the work are the copious observations of Dr. Chapman on the ova, larvæ and pupæ of the various species. Investigations into the early life-histories of species are destined to be a real aid in many cases towards classification—not an infallible one, as is proved by the marked difference in the pupæ of *Chattendenia* (*Edwardsia*) *w-album* and *Strymon pruni*, which species will eventually prove, we believe, to fall into the same genus—but in spite of this, we think they will eventually be a not unimportant aid.

We cannot close without referring to some of the plates, Plate iv., the life-history of *Callophrys rubi*, Plate ix., *Strymon pruni*, and fig. 3 on Plate xix. call for special remark.

The whole volume is an advance on anything yet published on the British butterflies, and will form a solid basis from which the Palæarctic species may be dealt with later on. We feel that if much reading is a weariness to the flesh, yet the labour spent is not in vain; and that, whilst in the days gone by, old Merlin could utter those words of wisdom attributed to him by our great poet:

"Rain, sun and rain! and the free blossoms blow;
Sun, rain and sun! and where is he who knows?
From the great deep to the great deep he goes"—

yet we may venture into the "great deep," and, learning to know the wondrous life surrounding us, instead of being angered at the riddling propounded by the old sage, riddling as true now as ever it was, we shall profit by it and learn to love as well as know the wondrous organisms around us which so many see—but seeing, see not.

The British species of *Hydræcia*—*Hydræcia crinanensis*, n. sp.

By (REV.) C. R. N. BURROWS.

Some time since I dissected the ♂ genitalia of *Hydroecia nictitans* and *H. paludis* and found them abundantly distinct. Since then, with Mr. F. N. Pierce, I have examined the genitalia of a large number of these species, together with the "moss" form, *H. lucens*, and certain Scotch examples taken by Messrs. Bacot and Simes near the Crinan Canal. The result has been most interesting and unexpected; not only do *nictitans*, *paludis*, and *lucens* prove to be abundantly distinct, in both sexes, but we have also discovered a fourth species among the specimens from Scotland, for which Mr. Pierce and I propose the provisional name *crinanensis*, from the locality whence the specimens were obtained. This species also occurs amongst specimens which Dr. Chapman has received from continental sources, and labelled "Turkestan." The publication of the description of these forms, the illustration of the genitalia in both sexes, and their general differentiation cannot be published just at present. More time is needed, and the whole question of their distinction is a serious one, involving a consideration of the distribution of the various forms and other details. For the present we simply wish to put on record the fact of our having four distinct species of the "*nictitans*" type, leaving the further account thereof to be dealt with in the not far-off future.

COLEOPTERA.

XANTHOLINUS DISTANS, KR., NEAR DUMFRIES.—On May 1st, this year, I took a specimen of the rare *Xantholinus distans* in flood refuse at Kelton, near Dumfries. In the report of the Proceedings of the Entomological Society (*Ent. Mo. Mag.*, 1908, p. 141) it is recorded as new to the British list, which, of course, is not the case, and also as taken at Helton instead of Kelton. As Champion points out (*loc. cit.*), he took a specimen at Brèmar (but in 1873, not 1878, as there stated), and this is mentioned in Fowler (*Col. Brit. Isles*, vol. ii., p. 291). When the Irish list was published in 1902, the authors, in bringing forward *X. cribripennis*, Fauv. (p. 656), suggested that it was likely that some of the Scotch records of *distans* might be referable to *cribripennis*. In a criticism of the last catalogue of British coleoptera (Beare and Donisthorpe, 1904), Mr. Newbery writes (*Ent. Record*, 1905, p. 19) "the specimens in British collections under *X. distans*, are most probably *cribripennis*, Fauv." In our reply to this, we pointed out (*loc. cit.*, p. 22) that "most probably" was neither scientific nor accurate, and that we were right in retaining both species in the list, which, of course, is the case.—HORACE DONISTHORPE. *June 6th*, 1908.

HYDROBIUS FUSCIPES, L., AB. CHALCONATUS, STEPH., AT TOTTENHAM.—Whilst fishing for water-beetles at Tottenham, with Mr. Pool, this month, a fine specimen of this aberration was fished up. Stephens (*Mand. Coleopt.*, vol. ii., p. 128, 1829) mentions that the colour is very variable, brilliantly metallic, coppery or brassy black, or of a splendid greenish-brass, sometimes violaceous or bright green. My specimen has the elytra coppery and the head and thorax greenish-blue with a coppery reflection. The var. *aeneus*, Sol., brought forward in Sharp and Fowler's Catalogue, 1893, is a synonym of *chalconatus*, Steph.

Other records are Barnes Common (E. C. Rye), Sheppey and Woking (Walker), Little Blakenham (Morley), etc.—*Id.*

TWO NEW LOCALITIES FOR *BLEDIUS FEMORALIS*, GYLL.—When in the New Forest last month, I discovered a colony of *Bledius femoralis* on a patch of damp white sand. I now find that all the specimens of a *Bledius* I took in Richmond Park some years back are this species, also taken by Prof. Beare there.—*Id.*

NOTES ON COLLECTING, Etc.

FIRST BROOD OF *AGROTIS PUTA*.—Little enough seems to be known of the first brood of *Agrotis puta*, and one finds scarcely any record thereof. It may be worth while, therefore, noticing that I found a specimen resting on the window of my house on the morning of June 4th.—A. M. COCHRANE, Lewisham. *June 8th, 1908.*

THE SCOTCH *ANTHROCERA ACHILLEÆ*.—I was much interested and gratified to read in the current volume of this magazine, pp. 73 and 74, that the identity of the species of *Anthrocera* which I have long suspected existed in the western Highlands of Scotland, had been established. Mr. Tutt is quite correct in stating that the first specimen of *A. achilleæ* taken in Britain was the one captured by myself and referred to in *Natural History of British Lepidoptera*, vol. i., p. 442. I have seen the specimens obtained by Mr. Cockayne from Mr. Renton, and they are identical with the *Anthrocera* captured by me in Argyllshire on July 8th, 1898. As a matter of fact, I am rather surprised the point has not been cleared up before, because, in this magazine, vol. xiii., pp. 136 and 137, I gave a full account, with locality, of my capture, and I have been expecting to hear something about it each season since then. It is a rather remarkable fact that, in chatting about my specimen with Mr. Tutt shortly after its capture, he expressed the opinion that, from my description, it might very probably be *A. achilleæ*, and, on inspecting the collections in the British Museum, which I did, I gave particular attention to the series of this species, but as I had not my specimen to compare with them, I did not succeed in identifying it.—W. G. SHELTON, F.E.S., Youlgreave, South Croydon. *June 6th, 1908.*

ABUNDANCE OF *HYPONOMEUTA* LARVÆ.—In a hedge in the near neighbourhood of Knockholt Station, are a number of large bushes of spindle, *Euonymus europæus*, the rest of the hedge being composed chiefly of whitethorn and hazel. On June 8th, these spindle-bushes presented a most remarkable appearance. They were absolutely stripped of their foliage, and the branches and twigs covered everywhere with ropes of silk spun by the now nearly fullfed larvæ of what appeared to be *Hyponomeuta cagnagellus*. There was no further food for the larvæ, and they were rolled up in almost solid little masses in nests spun in the hawthorn, which, however, they had not eaten. They were, in spite of the apparently disastrous want of food, plump and healthy, and would no doubt shortly pupate, food or no food, and cover the hedges with their marvellous little, spotted, snowflake-like bodies. On the same day, in the town of Sevenoaks, the hawthorn-bushes were almost equally severely attacked by the larvæ of the allied *Hyponomeuta padellus*. In Lewisham, the larvæ of one of the species of *Hyponomeuta* is a great nuisance in gardens, defoliating the bushes of

Euonymus japonicus, which is grown in almost all the gardens hereabouts as a foliage plant, covering the shrubs with unsightly webs, whilst, later in the year, the imagines may be found in thousands on the fences, not always of a pronounced white form, although Mr. Adkin (*Proc. Sth. Lond. Ent. Soc.*, 1907-8, pp. 83-34) notes it as *H. cagnagellus*.—A. M. COCHRANE, Lewisham. *June 10th*, 1908.

LEPIDOPTERA IN NORTH KENT.—The first brood of *Hellinsia carphodactyla* is now appearing in confinement. On June 10th, a run over the chalk downs also showed that the species was emerging in nature, whilst a less expected capture was a fine *Oxyptilus parvidactyla*. I was also very satisfied at finding a larva of *Odontia dentalis* boring into the stem of *Echium vulgare*. On June 8th, I obtained a short series of *Minoa murinata* at Chatham, but, though insects are coming out rapidly now, they are few in numbers, and a walk through Chattenden Roughs yesterday only resulted in my seeing one *Zonosoma omicronaria*, a few *Cabera pusaria*, *Acidalia aversata*, and several of *Scoparia ambigualis*, but not 50 lepidoptera altogether, whilst the larvæ of *Chattendenia n-album* are exceptionally scarce.—J. OVENDEN, Strood. *June 11th*, 1908. [Larvæ of *Odontia dentalis* were found just spinning their puparia on June 24th.—J. O.]

LARVAL DEPREDACTIONS AT THE TOPS OF TREES.—On Monday, June 1st last, a violent storm swept across the north end of the well-known Chestnut Avenue in Bushey Park, near Teddington. The wind was at its highest about 9.55 p.m., and, according to those on the spot at the time, the whole of the 110 trees blown down were overthrown in about three minutes. In one spot I counted three or four whitethorns, five oaks, eleven elms, four chestnuts, and thirty-five limes. I found the thorns had been snapped off a few feet above the ground, and that the stems were much riddled by the borings of beetles. The other trees were torn up by the roots. I was able to examine the topmost twigs of some of the lime trees, three of which were just over eighty feet in height. (Measured by stepping along beside the prostrate tree.) Many of the topmost leaves were much eaten by larvæ, though the leaves attacked were not so numerous as those nearest the ground. I failed to find any larvæ, but the wind and rain had no doubt destroyed many of them. The opportunity of examining the highest leaves of such tall trees does not often occur.—ALFRED SICH. *June 17th*, 1908.

HYBERNATED PYRAMEIS ATALANTA.—On May 31st, at 5.42 p.m., I have just seen *Pyrameis atalanta* in the same sunny corner I usually see one or more at this time of year. It was a very much hibernated specimen, female. On June 4th I saw two more *P. atalanta* near the same place as the first one reported, and one in the vale about a mile off.—G. O. SLOPER, F.E.S., Westrop House, Highworth. *June 3rd*, 1908.

IRREGULARITY IN THE FEEDING-UP OF LARVÆ KEPT UNDER IDENTICAL CONDITIONS.—In the last number (*antea*, p. 145) I noted the awakening of the larvæ of *Aporia crataegi* and *Leucoma salicis* from hibernation, quite at the end of April. With the first, I have not been too fortunate. Sleeved out in the garden on wild-crab, their numbers have decreased until only nine were left on June 11th (possibly the others have been destroyed by earwigs, although I have found none in the sleeves). These nine, however, are worth noting. On the morning of June 13th one had just pupated, another had spun its silken pad

and girdle. and was in the quiescent stage preceding pupation (pupation took place on the 15th), three others were about 1 inch long, whilst the remainder were still exceedingly small, one hardly more than .375 in. in length. Yet they were all out of the same batch of eggs, and have been treated the same way ever since the end of July, 1907, when they hatched. Similarly, with regard to *Leucoma salicis*, the larvæ of these all hatched last August, lived in the same sleeves, came out from hybernation on the same day (about April 26th), have been in the same sleeve, and yet some of these are just ready for pupation, whilst others are still hardly any larger than when they left their hybernacula. I cannot say these all came from the same batch of ova, on the contrary, I believe they were part of three batches, but they all hatched the same week, viz., the third week in August, 1907.—A. M. COCHRANE, Lewisham. June 16th, 1908.

GRACILARIA SYRINGELLA FLYING OVER ELDER.—I have solved my puzzle (*antea*, p. 145) as to *Gracilaria syringella* flying over elder. A small privet-bush growing among the elder was quite overlooked. Its leaves are, like those of the other privet-bushes in the garden, quite disfigured by the bladdery swellings that the larvæ of *G. syringella* make. One of those I opened contained five of the little transparent greenish larvæ.—ID.

IRREGULAR HATCHING OF EGGS OF ENNOMOS TILIARIA.—In mid-October, 1907, I found a ♀ *Ennomostiliaria* resting on a horse-chestnut tree in East-down Park. She laid a number of the characteristic flat brick-shaped eggs, which remained all the winter, but commenced to hatch on June 4th, 1908; since then they have emerged at the rate of two or three a day, missing some days, until now (June 16th) some 42 have hatched altogether, leaving eight unhatched.—ID. [The last egg hatched June 24th.—A.M.C.]

PEGOMYIA UNIVITTATA NOT IN IRELAND.—There is a slight error in the "Current Notes" of the June *Record*. I did not take *Pegomyia univittata* in Ireland, but *P. flavipes*, Fln., a species already in our list, and it was by comparison with my specimen of *P. flavipes* that Mr. Carter was able to differentiate *P. univittata*.—H. W. ANDREWS, F.E.S., Shirley, Welling. June 17th, 1908.

TROCHILUM ANDRENIIFORME IN KENT.—I bred the only example of this insect, which I was fortunate enough to get into pupa this year on June 15th.—J. OVENDEN, Frindsbury Road, Strood, Kent.

FIRST BROODS OF ADACTYLUS BENNETII AND OTHER PLUMES.—I found the first brood of this species fully out in the Medway marshes on the evening of June 15th. On the preceding day, *Adkinia bipunctidactyla* was discovered in a wood, on the Maidstone Road; whilst possibly not a third of the larvæ of *Hellinsia carphodactyla* collected here have produced imagines during the last ten days; a tremendous number of ichneumons, however, have emerged.—J. OVENDEN. June 16th, 1908.

CURRENT NOTES.

The Swiss entomologists on a limited local knowledge of the two allied Satyrids—*Satyrus alcyone* and *S. hermione*—are always inclined to lump these as one species. Those entomologists with wider knowledge insist very strongly on their separation. To us there is no doubt

of their distinctness, our conclusion being based on the specimens captured in various localities between (and including) Austro-Hungary and Spain. In some districts both occur, rarely in the same place, in most districts they are very separate in their habitats. A most interesting paper on the subject by Mr. C. Oberthür has just appeared in the *Bull. de la Soc. Entom. de France*, 1908, pp. 151-3. One rarely finds any difficulty about the species when one really knows both, the difficulty generally occurs in attempting to find *S. hermione* among large *S. alcyone*, or *vice versa*, where only one species occurs. Among the finest specimens of *S. hermione* are those from Fontainebleau Forest, a locality which Mr. Oberthür strangely omits. On the other hand, whilst he gives Aix-les-Bains as a locality for *S. alcyone* only, yet about four miles distant, near Grésy-sur-Aix, we have met with nothing but *S. hermione*, and our experience at Digne, in early August, 1907, was that among the swarms of freshly-emerged lovely large *S. hermione* on the trees near the Baths, there was no trace of *S. alcyone*, whilst on the rocks in the little glen not more than a quarter of a mile away, only *S. alcyone*, worn to shreds, put in an appearance on the same days. At Clelles, St. Michel de Maurienne, Bourg St. Maurice, and many other places not mentioned by Mr. Oberthür, only *S. alcyone* is found, whilst we have a much longer list than he where *S. hermione* alone occurs. We have never yet seen a Swiss *S. hermione*, certainly one expects that it does not occur in the Rhone Valley in Switzerland, although the lovely specimens of *S. alcyone* from the Mt. Salève and the lower parts of the Valais might tempt the uninitiated into believing the larger species really occurred there. At any rate, European butterfly-hunters should read Mr. Oberthür's note on these insects.

It marks quite a new era in our knowledge of the genitalia of lepidoptera that the ♀ structures should afford quite as good differential characters as the ancillary appendages of the ♂s, and that, by means of the use of wood-naptha, it is possible to examine the genitalia *in situ*, and thus avoid mutilating the specimens.

The *Thirty-first Annual Report and Proceedings of the Lancashire and Cheshire Entomological Society* presents two features of more than usual interest (1) The address of Dr. Bailey, dealing with "The Coleoptera of the Isle of Man," and (2) Mr. W. E. Sharp's Catalogue of the "Coleoptera of the Counties of Lancashire and Cheshire." Coleopterists would be well-advised to obtain this Report from Mr. H. R. Sweeting, 2, Halkyn Avenue, Sefton Park, Liverpool, and bind them together as "The Coleoptera of Lancashire, Cheshire, and the Isle of Man" for future reference. Otherwise, such papers are apt to be forgotten or overlooked.

The *Proceedings of the South London Entomological and Natural History Society*, 1907-8, is, as usual, full of very interesting material, quite excellently indexed. The special papers are "An introduction to the early Literature of Entomology," by H. J. Turner, F.E.S.; "Rhopalocera in the Taunus Hills," by A. Sich, F.E.S.; "Notes on *Porthesia chrysorrhoea*," by R. Adkin, F.E.S.; "Some notes on *Pieris napi*," by Hugh Main, B.Sc., F.E.S.; "Further notes on *Tortrix pronubana*," by R. Adkin, F.E.S.; whilst the Annual address by the same gentleman is exceptionally interesting, being, in large measure, a historical account of the evolution of the Society. No one is better fitted to write this than Mr. Adkin, to whom the Society owes more than

to any other individual member, besides, it happened that Christmas, 1907, brought us to the end of a two-years' (1906-7) service as president, a fitting coming-of-age to the previous two years' service which Mr. Adkin gave in 1886-7, in the same official capacity. As President, Vice-President, Treasurer, Member of Council, indeed, as everything that would aid the Society, Mr. Adkin has given official and unofficial service for a very great number of years. Whatever has had to be done, or found, or settled, Mr. Adkin has been the man to do, find, or settle, and the now long series of *Proceedings* of the Society is largely due to his unflagging zeal and generous aid. The "Annual Meeting" held in January last paid a most fitting tribute to the esteem in which he is held by his fellow-members, but there is nothing of this to be gathered from the report of the meeting, Mr. Adkin's editorial hand having eliminated everything except the most business-like statements that the speakers may have unknowingly uttered. It is our earnest wish that the South London Entomological Society may long number Mr. Adkin among its official members, and that others like he may long continue such generous service. Our notice of the *Proceedings* must not close without reference to the five beautiful plates that enrich it, from photographs by two of the most popular members, Messrs. H. Main and A. E. Tonge. Those illustrating "The lifehistory of *Charaxes jasius*" are well-nigh incomparable.

Another excellent volume of the *Bolletino del Laboratorio de Zoologia Generale e Agraria della R. Scuola Superiore d'Agricoltura in Portici* has just come to hand. There are 211 figures in the text, which seems throughout excellent. The greater part of the volume is taken up with a detailed account of the "Insect enemies of the olive"—diptera, hymenoptera, lepidoptera, Coccids, etc., including a new genus of lepidoptera. The rest of the volume is occupied with an apparently first-class paper by Silvestri, entitled "Material for the study of the Thysanurids." The *Bolletino* is evidently taking a high place in Italian entomology.

Just as the crude bringing together of specimens of a species from a large tract of country bearing a common geographical name, and their division into heavily-marked and lightly-marked forms, and the insistence that one or other is a "wet," and the other a "dry," seasonal form, without an atom of knowledge as to whether (1) the specimens have even come from the same locality (or even an approximately near one), (2) the specimens really represent one, two, three, or even a dozen broods, have shaken the belief of all thinking lepidopterists in many probable cases of real seasonal dimorphism, so the insistence that certain distantly related species, supposed to inhabit the same district, are mimics one of another, without any real knowledge on the part of the theorist of the habits of the species alive, or even that (1) the species fly together at the same time on the same ground, or (2) have any habits in common, has made most lepidopterists a bit tired of this museum-made mimicry. It is, therefore, a great relief to have Mr. Guy Marshall's critical paper, entitled "On Diaposematism with reference to some limitations of the Müllerian Hypothesis of Mimicry" (*Trans. Ent. Soc. Lond.*, pp. 93 *et seq.*), which brushes aside, with the certainty of first-hand knowledge, some of the theories propounded of late years about certain of the species whose life-habits he knows so well. We have always insisted that the place to study seasonal

dimorphism and mimicry, at any rate, at first, is in the field, and our contention is amply justified by Mr. Marshall's clear and trenchant criticism. What a lot of time, trouble, and paper would have been saved had Mr. Marshall written us the facts of the life-habits before the supposed mimicry of the species had been dealt with, rather than have had the suppositious side of their mimicry written up first, and the facts of their life-habits so much later! It is advisable to keep well in mind the critical, although offhand, statement made by one of our fellows after a lengthy discourse on the "seasonal dimorphism" of some Central American Callidryads—"Ah, yes, if they are the examples in the 'X' Museum, I think I took them congregated round the same puddles on the same day." One wondered then, and still wonders, how far merely museum theories are ever right.

An excellent piece of literary work has just been published by Professor C. H. Fernald, on "The Genera of the *Tortricidae* and their types" (obtainable from Carpenter and Morehouse, Amherst, Mass., U.S.A.). The references appear to be quite trustworthy, although some of the conclusions may be open to question. The future worker will not be likely, however, to sink so many genera as the learned Professor appears to think desirable, but this is quite apart from the excellence of his work, which is so arranged, that workers can get at the facts without being at all prejudiced by opinions. Every systematist should see this booklet (pp. 1-68).

It may be advisable to state that, owing to alterations in the system of heating, the Insect Rooms at the British Museum, South Kensington, will be closed from July 1st to the end of September.

The Société lépidoptérologique de Genève continues its successful career, and the third fascicule of its *Bulletin*, under the editorship of Professor C. Blachier, maintains well the reputation of its predecessors. It is full of excellent things, and illustrated by two plates of newly-named aberrations of butterflies. Besides "The Presidential Address," by Mr. A. Pictet, there are—(1) The Proceedings of the monthly meetings. (2) List of Members. (3) "Varieties and aberrations of *Erebia tyndarus*," by Dr. Reverdin. (4) "On the fertility of the second broods of European Spingids," by Dr. Denso. (5) "The genus *Leptidia*," by J. Culot. (6) "The lepidopterological fauna of the pierriers of the Alps in 1907," by P. A. H. Muschamp, F.E.S. (7) "List of lepidoptera captured in the Valais in July, 1907," by M. Rehous. (8) "Aberrations of lepidoptera," by M. Rehous. (9) "New aberrations," by P. A. H. Muschamp, F.E.S. (10) "Description of varieties and aberrations of lepidoptera," by J. Culot. Dr. Reverdin's is a particularly good piece of work, and Dr. Denso's is suggestive, though several facts, published in our *Natural History of British Lepidoptera*, vols. iii. and iv., bearing on the subject would have helped to have developed his suggestions regarding some of the species. We are pleased to see Mr. A. Pictet re-elected president, whilst the Society honours itself in honouring Mr. P. A. H. Muschamp, who must be looked upon as the founder of the Society, and his title, "Membre fondateur honoraire," is well-deserved. Students of European lepidoptera will find the *Bulletin* full of interest, whilst most of the papers will appeal strongly even to those who merely study British species. We wish our Geneva friends and fellow-members every success.

It is with the greatest regret that we have to record the death of

one of the most genial of our British lepidopterists, William Henry E. Thornthwaite, whose decease on June 27th, at the age of 58, was most unexpected. He was in his usual health on the 25th, on the evening of which day he attended a dinner at the Savoy Hotel. During the meal he fell back insensible, and, although immediate medical aid was at hand, he never recovered consciousness, and died in about 30 hours. He was an excellent lepidopterist, studying the micro- as well as the macro-lepidoptera, and was also greatly interested in Astronomical Science, whilst his charming personality endeared him to all who were fortunate enough to share his friendship. He had a most successful business career, and at the time of his death was Chairman of the Board of Directors of The Gresham Life Assurance Society, a position that he had held for very many years. He was exceedingly devoted to his work, and was always findable by friends in his rooms at St. Mildred's in office hours. Privately he did much to support our favourite study, and, whilst entomologists generally have lost an excellent colleague, some of us have also lost a dear and honoured friend. Truly 1908 is bearing hard on British entomologists.

We have received from the Rev. A. M. Moss, who is now the Chaplain of the Anglo-American Church at Lima, Peru, a most interesting booklet, entitled "A Souvenir of the Oroya Railroad," with 64 excellent photos, and explanatory text, illustrating a journey from Lima to Oroya, up the Pacific slope of the Andes, a distance of 138 miles, in which the railroad at its highest point, 107 miles from the start, reaches an altitude of 15,665ft. Even seasoned travellers have to think to recognise what this means. There is a suggestion of another series of the Junin Valley, in which the railway continues down the opposite slopes of the mountains to La Merced, which, 90 miles from Oroya, has descended to 2,550ft. into the heart of tropical Peru.

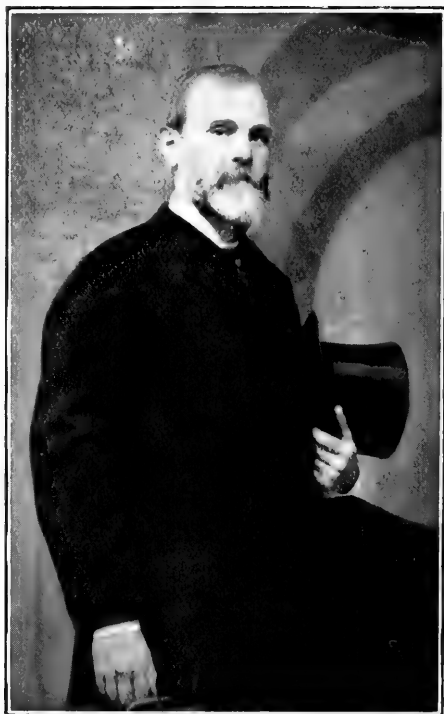
Mr. E. A. Newbery, "with some hesitation," adds (*Ent. Mo. Mag.*) *Phyllotreta diademata*, Foudr., to the British list on the authority of Capt. Deville, the specimens on which the determination has been made having been captured in South Devon by Mr. De la Garde.

SOCIETIES.

BIRMINGHAM NATURAL HISTORY AND PHILOSOPHICAL SOCIETY.—The newly constituted entomological section (the old Birmingham Entomological Society) held its first meeting after the amalgamation on April 13th. The President, Mr. Geo. T. Bethune-Baker, F.L.S., F.Z.S., F.E.S., in the chair. The resignation of Mr. Colbran J. Wainwright, F.E.S., from the Hon. Secretaryship, after nineteen years' service, was received with great regret, and Mr. A. H. Martineau, F.E.S., was elected to fill the office for the ensuing year. The President exhibited and described some *LYCENIDÆ* from Australia, all of which are associated with ants during some portion of their life-history. Mr. H. Willoughby Ellis, F.Z.S., F.E.S., gave an account of the present knowledge of British myrmecophilous *Lycenid* larvæ, and gave a list of records to date with remarks on the methods pursued by the ants in obtaining the juices from them. He also gave an account of the British myrmecophilous coleoptera, with special mention of the

work he and Mr. A. H. Martineau had carried out in the Midlands during the past year. Mr. A. H. Martineau exhibited specimens of *FORMICOXENUS NITIDULUS*, Nye, from the nests of *Formica rufa*, L., from Knowle (Warwickshire). Mr. Herbert Stone, F.L.S., F.R.C.I., exhibited a piece of marble ebony sapwood showing ebony around the galleries of insects, also lancewood similarly ebonized. Mr. Hubert Langley, specimens of *ASTHENIA PYGMÆANA*, Hb., and *ANYBIA EPILOBIELLA*, Roem., from Princethorpe, both species being additions to the Warwickshire list. Mr. H. Willoughby Ellis read a paper on the present knowledge of the genus *DINARDA*, Grav., embodying the work of Donisthorpe and Wasmann and his own observations of the species collected from the nests of *Formica rufa*, Linn., and *F. sanguinea*, Latr., and also from a number of specimens received from friends.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.
—May 14th, 1908.—**LARVA OF CYANIRIS SEMIARGUS.**—Dr. Chapman exhibited a larva of *C. semiargus* reared from a Pyrenean ovum, nearly full-grown. **SCALING OF TANAGRA ATRATA.**—He also called attention to the curious fine brown scaling in bred Pyrenean examples of *Tanagra atrata*. **LARVÆ OF RETINIA RESINANA.**—Mr. Adkin, nodules of resin on twig of fir attacked by *Retinia resinana* larvæ, also a curious "mop" of twigs on a branch of fir, no doubt caused by a gall, from Aviemore. **COCOONS OPENED BY BIRDS.**—He also exhibited cocoons of *Dicranura vinula* that had apparently been opened by birds. **ARGYNNID LARVÆ.**—Mr. Newman, two sets each of larvæ of *Dryas paphia*, *Argynnis aglaia*, and *A. adippe*, one set had been wintered outdoors and were very small, the others kept in a cool house were in their last instar. **PYRAMEIS ATALANTA EGGS.**—He also showed ova of *Pyrameis atalanta* just hatching, the eggs recently found near Dartford. **HUNGARIAN BUTTERFLIES.**—Mr. A. H. Jones brought a number of butterflies taken in Hungary to illustrate his paper "Notes on Hungarian butterflies," including *Neptis lucilla*, *N. aceris*, *Najas populi*, *Limenitis camilla*, and *L. sibylla* taken together in one forest opening, *Loweia alciphron* extremely large and boldly marked, *Colias myrmidone* ab. *alba*, a parallel form to ab. *helice* of *C. edusa*, the local *Erebia melas* (with which he had placed *E. lefebrei* from the Pyrenees and *E. glacialis* var. *nicholli* from Campiglio for comparison), *E. medusa* var. *psodea*, *C. thersamon*, *Pararge climene*, *P. roxelana*, *Coenonympha oedippus*, etc. Mr. West exhibited *ANTICLEA BADIATA* bred from larvæ taken on his rose-trees in Ashtead. Mr. Tonge, stereoscopic views of the ova of *SATURNIA CARPINI* and *MACROTHYLACIA RUBI*, of the ova of *MALACOSOMA CASTRENSIS* and *M. FRANCONICA*, and of fertile and infertile ova of *PANOLIS PINIPERDA*. Mr. Newman, pupæ of *DRYAS PAPHIA*, *ARGYNNIS ADIPPE*, and *A. AGLAIA*. Mr. Rayward, pupa *in situ* of *TROCHILIMUM CRABRONIFORMIS*, and pupa-case of *ÆGERIA CULICIFORMIS*; the former emerged downwards and the latter upwards. Mr. Turner, a long series of *PANCALIA LEWENHØCKELLA* from Box Hill; a short bred series of *SWAMMERDAMMIA GRISEO-CAPITELLA* from Oxshott. Mr. Gilbert Arrow gave an address, illustrated by means of lantern slides and numerous specimens, on "The Origin and Use of Horns in Coleoptera."



Souvenir amical
P. Finot,

PIERRE ADRIEN PROSPER FINOT.

The lepidoptera of the Grisons—St. Moritz to the Morteratsch Glacier.

By J. W. TUTT, F.E.S.

Leaving Airolo, the weather changed : two days of broken weather (including heavy thunderstorms) at Lugano were spent largely in the town itself, *Heodes virgaureae*, *Melitaea athalia* (certainly, I think, the Airolo species), *M. didyma*, *M. phoebe*, *Iptidia sinapis*, joining *Epinephele ianira*, *Pieris rapae*, *P. brassicae*, *Polyommatus icarus*, *Coenonympha pamphilus*, and *Colias edusa* on the railway-bank, in the hot sun on the morning of August 11th. This day was glorious, and we started early, by boat, for Chiavenna, which was to be the stopping-place for the night, on the way to the Upper Engadine. Nothing could have been more delightful than the journey on Lake Lugano and Lake Como, nor the next day's coach ride up the Val Bregaglia, over the Maloja Pass to St. Moritz. We were now on well-known ground, and, as the morning of the 13th broke gloriously, we wended our way through the well-known woods to Pontresina. We spent the whole of the morning on the way, with disappointing entomological results. At the very commencement of the walk, *Gnophos obfuscata* was abundant, whilst larvæ of *Papilio machaon*, from newly-hatched to fullgrown, were common on the banks by the edge of the path. These pupated in due course, and the first three imagines appeared simultaneously on June 27th, 1908, some of the other pupæ showing the imaginal colours distinctly on the same date. With the exception of *Erebia goante*, *E. euryale*, *E. tyndarus*, *Agriades corydon*, and *Argynnis aglaia*, no butterflies were common, although *Issoria lathonia*, *Melitaea athalia* (worn), *Polyommatus icarus*, *Coenonympha darwiniana*, and a single *Plebeius optilete*, were also observed, whilst a walk round the Statdsee would, had one been disposed to take them, have produced long series of *Carsia imbutata*, *Crambus margaritellus*, *Aphelia osseana*, *Bactra lanceolana*, etc., whilst a single plume that was captured proved to be *Emmelina monodactyla*. In the woods *Cidaria populata* was in swarms, and *Fidonia bruneata* was not uncommon, but this seemed poor for such a district. At Pontresina, opinion was divided as to where the afternoon should be spent, but entomological considerations finally took a second place, and we settled for the Morteratsch. The fields by the road, between Pontresina and the Glacier, showed an abundance of *Erebia euryale*, *E. tyndarus*, *Brenthis pales*, *Colias phicomone*, whilst *Heodes virgaureae* (worn), *Plebeius argus* (*argyrognomon*), and *Issoria lathonia* were frequent, and one started the walk along the Morteratsch moraine with hopes of better things ; but these did not come our way. The afternoon was perfect, the surroundings delightful, but insects were remarkably scarce. *Argynnis aglaia*, *Brenthis pales*, *Heodes virgaureae*, *Urbicula comma*, *Hesperia alveus*, *Plebeius argyrognomon*, and *Coenonympha satyrion* were all there, but so sparingly that not more than two or three of each species were taken, whilst, of *Anthrocera exulans* a single large ♀ in fine condition, and of *Erebia epiphron* two or three specimens only, were netted. One fine ♀ of the latter was discovered on the ground, but quite dead, evidently just killed by an ant that was steadily working it over the pathway towards its nest. We reached

SEPTEMBER 15TH, 1908.

far up the slopes, above the higher moraine, and sat and enjoyed the scenery till time warned us that it was a long step back to St. Moritz, but we were unfortunate entomologically, and lepidoptera refused to come our way.

The lepidoptera of the Grisons—the Roseg Valley.

By J. W. TUTT, F.E.S.

Next morning, August 14th, was also fine, and the slopes above Pontresina suggested that *Erebia flavofasciata* might still be obtainable, but, in spite of the lateness of the season, we thought the journey would most probably be wasted. Besides, I wanted to go up on the Roseg Glacier, and it looked an easier journey for a lazy entomologist. This day was another full of enjoyment. I walked smartly through the woods to the entrance of the Roseg Valley, and then just simply basked in the hot sun all day, acting well up to the motto of never doing to-day what you could possibly put off till to-morrow, not forgetting, however, that butterflies must be caught to-day or they would not be seen to-morrow. At the entrance to the valley, *Brenthis amathusia* and *B. ino* were in abundance, unfortunately worn, whilst *Argynnis aglaia* and *A. niobe*, many just emerging, were in the utmost profusion. They swung with wings extended horizontally from every flower, or flew rapidly off and back again, as if on an important errand. Some of the undersides of *A. aglaia* were remarkably yellow, others almost brown, whilst of *A. niobe*, bright silver-spotted undersides were, perhaps, more abundant than the yellow-spotted on a bright red ground; *Issoria lathonia*, too, was common, and only those who have seen five different species of large "fritillaries" really abundant on the same ground can tell how beautiful a sight it is. Down in the bottom of the valley, as well as on the slopes, *Colias phicomone* abounded, but they wanted overhauling for good specimens. Only the four usual *Erebias* were noticed—*Erebia goante*, *E. euryale*, *E. tyndarus*, and *E. melampus*, but these were plentiful enough, one ♀ *E. euryale* having the usual fulvous area of the forewings quite yellow. *Coenonympha pamphilus* occurred with *C. satyrion*, *Polyommatus icarus* swilled at the runnels with *P. eros*, and *Agriades corydon* was as abundant as *Plebeius argus* and *Aricia astrarche*, whilst *Hesperia alveus* and *Urbicula comma* appeared to be everywhere. The undersides of some of the *P. eros* appeared to tend to the *obsoleta* form, one in particular has the usual transverse row of spots on the hindwings absent, and that on the forewings much reduced in number (four only being present). *Polyommatus donzelii* and *Cyaniris semiargus* were also observed, and several *Cupido minimus*. In fact, it was the presence of these "blues" that settled my never reaching the glacier this day, for I might not come across *C. minimus* again, before I published my account thereof in the *Nat. History of British Lepidoptera*, and, whilst the chance occurred, observations of these common species had to be made, so I spent a couple of hours with them, and then it was lunch time. A single large ♀ *Melitaea didyma* puzzled me much till it was captured. I did not see another. So far as my memory served, I had been told that the chief ground in the valley was above the woods on the left-hand side facing the glacier, and, as this was known, I thought I would take the right-

hand side, and so I climbed the slopes and bagged what I could come near. Most of the species already noted were there in abundance, but there were other interesting things. *Charaëas graminis* madly scurrying from one flower to another when disturbed during its afternoon siesta (or meal), *Lithosia lutarella* (*pygmaeola*) of the brightest orange mountain form, the ♂s in the most amazing abundance, assembling to the newly-emerged ♀s, and, if too late, settling down on the grass-culms near by. *Adscita geryon*, also abundant and active in the afternoon sunshine, flying quickly and easily getting out of view, and much more readily captured whilst resting on the flowers, both sexes being in first-class condition. *Gnophos obfuscata* was also abundant on the flowers, and a specimen of *Emydia cribrum*, somewhat like the type, and not of the usual alpine *candida* form, was interesting. *Setina irrorella* occurred with *S. aurita* and *Lithosia lurideola*, but the latter was going over. Mixed with them, too, was an occasional *Anthrocera eculans*, giving some idea of the altitude. One of the most interesting species, however, was *Heodes virgaureae*, the ♀s of which, in spite of the elevation, were of bright ground colour, and two of which were marked most beautifully by a series of extended streaks (=ab. *lineolata*), in place of the usual spots, across the forewing. A *Melitaea*, indistinguishable from the mountain *M. athalia*, was taken quite near an undoubted ♀ specimen of *M. varia*, which, of course, except for the elevation, means practically nothing, whilst among the moths were many more interesting species, of which *Carsia imbutata* may be noted. It was a grand sight to see the insects as the sun went rapidly off the slopes about 3 p.m. They flew from place to place, sometimes swiftly returning, in the most restless and excited manner, and were most easy to capture; in half-an-hour the sun was gone, and, of the army of "fritillaries," "Erebias," and "blues," hardly a specimen could be seen a little later. That they remained on the slope I feel satisfied, but in half-an-hour they had entirely disappeared. Where do the butterflies hide by night? Of course, one sees one beneath the flower-heads occasionally, but where do the mass go? At the bottom of the slopes, two species of "plumes" were now to be disturbed, one *Merriellidia tridactyla* (*tetradactyla*), the other, I believe, *Adkinia coprodactyla*. Boxes were full, so we determined to close operations for the day. The next day was dull, and we walked to the Glacier and saw it closely under conditions of storm and rain, with a few occasional breaks that made the snow-clad, sunlit, Alps lovely beyond words. With the exception of *Fredericina tesseradactyla* (*fischeri*) and another doubtful Stenoptiliid, I added nothing fresh to the bag that day. On the morning of the 16th the snow was low down the mountains, reaching far below the new little station on the Schaffberg. It snowed and rained all that day, and on the 17th, as matters had barely improved, I thought I would utilise it for a move, travelling that day to Preda, on the Albula Pass, and arriving there in weather that might have done credit to December.

Synopsis of the Orthoptera of Western Europe.

By MALCOLM BURRE, B.A., F.L.S., F.E.S., F.Z.S., etc.

Genus: CALLICRANIA, Bolivar.

Ventral segments (at least the basal ones) represented by two callosities, one on each side of the medial line, and near together:

supra-anal plate ♂ placed below the anal segment; cerci ♂ large, the base broad and prolonged on the inner side into a stout tooth, from this point forwards, slender, and longer than the supra-anal plate, bent inwards at the apex and terminated in a sharp point; the subgenital lamina ♀ provided at the base with two oblique keels and bent inwards, forming a sulcus or hollow on each side, the rest membranous.

This genus was formed by Bolivar for the reception of about half a dozen species occurring in northern and central Spain and in Portugal.

TABLE OF SPECIES.

- | | |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|
| 1. Anal segment ♂ prolonged posteriorly into two stout lobes; supra-anal plate ♂ terminated in a sharp hook; last ventral segment ♀ broad, smooth, the other segments with two callosities | 1. RAMBURI, Bol. |
| 2. Pronotum with median keel | 2. OBVIA, Navas. |
| 2.2. Pronotum with no median carina | |
| 1.1. Anal segment ♂ with no diverging lobes; supra-anal plate ♂ not spined at apex; 3 last ventral segments ♀ simple, the others with two callosities. | |
| 2. Abdomen opaque, the segments not thickened posteriorly; subgenital lamina ♀ with the two oblique keels united in the middle. | |
| 3. Pronotum very rugose; anterior tibiae unarmed above, with a single apical spine; large | 3. SEOANEI, Bol. |
| 3.3. Pronotum smooth, translucent posteriorly; anterior tibiae with 1 spine beyond the middle above smaller | 4. PELLUCIDA, Bol. |
| 2.2. Abdomen shining, with posterior border of segments thickened; subgenital lamina ♀ with the two oblique keels distant from each other on inner side. | |
| 3. Keels of pronotum arched outwards, appearing to be continued insensibly with the posterior border, and crenulate or almost dentate | 5. SERRATA, Bol. |
| 3.3. Keels of pronotum straight and parallel, forming right angles with the posterior border, entire, or slightly crenulate. | |
| 4. Anal segment ♂ emarginate in middle; penultimate segment ventral ♀ smooth | 6. BOLIVARI, Seoane. |
| 4.4. Anal segment ♂ prolonged in the middle in a triangular lobe with a longitudinal sulcus; penultimate ventral segment ♀ with a conical protuberance in middle | 7. MIEGI, Bol. |

1. CALLICRANIA RAMBURI, Bolivar (?=*monticola*, Rambur).

Ochre-yellow (at least, in dried specimens); pronotum flat; anal segment produced into two lobes. Length of body, 28mm. ♂; of pronotum, 8mm. ♂; of posterior femora, 17mm. ♀.

Occurs in northern Spain, along the coast from San Vicente de la Barquera, near the border of the Asturias, past Bilbao, to the Pyrennes, where it occasionally occurs on the French side, as at Bagnères de Bigorre, Bellat.

2. CALLICRANIA OBVIA, Navas.

Resembles *C. ramburi*, but seems to differ in the more cylindrical cerci of the male, by the total absence of a median carina of the pronotum, which is distinguishable in *C. ramburi*, by the more rugose disc of the pronotum, and by the somewhat rugose side flaps, which are quite smooth in *C. ramburi*; the pronotum appears from the

descriptions to be more arched than in that species. Length of body (according to Navas, ? sex), 25mm.-30mm.; of pronotum, 10mm.; of posterior femora, 15mm.; of ovipositor, 17mm. ♀.

A native of the mountainous parts of Northern Aragon; first taken by Father Navas on the road from San Cosme and San Damian to the Pass of Fabana, and by Bolivar in the Sierra de Guara, and in the Peña de Oroel, near Jaca, and on the Canfranc road; the writer has taken immature specimens, probably referable to this species, near Jaca, at the Fuente del Salvador.

It was first placed by Father Navas in the genus *Platystolus*, which it resembles in the form of the cerci, but, on account of the form of the frons and the presence of a tubercle there, it has been removed by Bolivar to *Callicrania*, and it is undoubtedly allied to *C. ramburi*.*

3. *CALLICRANIA SEOANEI*, Bolivar.

Variable in size and colour. Generally uniform reddish-yellow. Length of body, 28mm. ♂, 25mm. ♀; of pronotum, 8mm.-9mm. ♀ and ♂; of posterior femora, 18mm.-19mm. ♂ and ♀; of ovipositor, 22mm. ♀.

On shrubs in north Spain, Galicia and the Asturias, as far as Santander, extending down to Burgos and Oña; also in the north of Portugal. The writer has taken it on the slopes of the Picos de Europa (Provincia de Santander).

4. *CALLICRANIA PELLUCIDA*, Bolivar (= ? *selliger*, Charp.).

Allied to *C. seoanei* but a little smaller, the pronotum is smoother, the metazona being almost translucent, and the anterior tibiae have two spines on the outer border. Length of body 25mm., ♂; of pronotum 7mm. ♂; of posterior femora 16mm.

Portugal: Serra de Gerez, Serra de Estrella and Beira Alta.

5. *CALLICRANIA SERRATA*, Bolivar.

Allied to *C. miegi* but distinguished at once from all its congeners by the pronounced keels of the pronotum, which are arched so that they appear to pass insensibly into the posterior border; the keels also have the peculiarity of being crenulate. Length of body 32mm. ♀; of pronotum, 8.5mm. ♀; of posterior femora, 20mm. ♀; of ovipositor 27mm. ♀.

Portugal: Milfontes.

6. *CALLICRANIA BOLIVARI*, Seoane.

Resembles *C. miegi*; keels of pronotum straight and parallel; anal segment of male excavate in middle; penultimate ventral segment of ♀ smooth. Length of body, 27mm. ♂, 25mm. ♀; of pronotum, 8.5mm.-11mm. ♂, 8.5mm. ♀; of posterior femora, 18mm.-19mm. ♂, 17mm. ♀; of ovipositor, 19mm.-20mm. ♀.

North-western Spain, in Galicia, at Ferrol, Parga, Santiago, Castelo and Ardemil; in these two latter localities it is unusually abundant in July and August. At Ardemil its distribution overlaps that of *E. seoanei*, while at Villa Rutis, the latter species exists alone. These two species are known in Galicia under the names of "carricantas"

* Now placed by Navas in a distinct genus, *Synephippius*.

and "canturinas;" unlike most others of the family, which generally chirp at night, these two species stridulate in full daylight.

7. *CALLICRANIA MIEGI*, Bolivar.

One of the largest species; it presents a remarkable variation in the size of the head, which is sometimes disproportionately big; the size of the whole insect varies also considerably; the dimensions given by Brunner are typical of those of the Escorial district, while Pantel gives much larger dimensions for specimens from the Sierra de Cuenca. Length of body, 33mm.-42mm. ♂, and ♀; of pronotum, 8.5mm.-11.5mm. ♂, 9mm.-12mm. ♀; of posterior femora, 23mm.-25mm. ♂ and ♀; of ovipositor, 30mm.-32mm. ♀.

In Portugal and central Spain: Coimbra, Emperador, Navacerrada, Escorial, Sierra de Cuenca, Embid, Mariana, Majadas, Valsalobre, but somewhat rare. Urda near Toledo.

GENUS: *PRÆPHIPPIGERA*, Bolivar.

This genus, with *Baetica* and *Platystolus*, differs from the preceding genera in the elevated vertex, with the fastigium scarcely produced, and with no tubercle; the fastigium is as broad as the first antennal segment.

This genus differs from the next two in the form of the pronotum, which is strongly elevated anteriorly, and keeled posteriorly in middle; the side flaps are roundly inserted and the lower border is sinuate. The elytra are present as small prominent flaps.

There is a single species.

1. *PRÆPHIPPIGERA PACHYGASTER*, Lucas.

Very large and plump; green or yellowish; ovipositor short, slightly incurved. Length of body, 32mm. ♂; 40mm. ♀; of pronotum, 10mm. ♂, 10.5mm. ♀; of posterior femora, 20mm. ♂, 25mm. ♀; of ovipositor, 24mm. ♀.

An Algerian species recorded from Sardinia.

GENUS: *BÆTICA*,* Bolivar.

The side flaps are roundly inserted, the lower border is straight and the pronotum is flattened above, and not elevated, but the metazona is arched; there are no elytra visible, and the pronotum has no lateral keels. A single species.

1. *BÆTICA USTULATUS*, Rambur.

Rather smaller than its allies; black; ovipositor curved, twice as long as the pronotum. Length of body, 18mm. ♂, 22mm. ♀; of pronotum, 8mm. ♂, 7mm. ♀; of posterior femora, 12mm. ♂ and ♀; of ovipositor, 16mm. ♀.

This species occurs under stones and on barren ground, almost entirely lacking in vegetation, on the peaks of the Sierra Nevada, almost up to the snow-line.

GENUS. *PLATYSTOLUS*, Bolivar.

In this genus the side flaps of the pronotum are set at an angle, and the metazona is keeled, so that the disc is separated from the side flaps.

* This apparently coincides with *Platyphippus*, Navas, but it is not certain which name has the prior right.

TABLE OF SPECIES.

- | | |
|-----------------------------------------------------------------------------------------------|----------------------|
| 1. Last dorsal segment with a spine above on the hinder margin; femora with black spots | 1. SURCULARIUS, Bol. |
| 1.1. Last abdominal segment with no spots; femora with no spots | 2. MARTINEZI, Bol. |

1. PLATYSTOLUS SURCULARIUS, Bolivar.

Big and fat, green or olive. Length of body, 35mm. ♂, 37mm. ♀; of pronotum, 10mm. ♂, 9mm. ♀; of posterior femora, 19mm. ♂, 21mm. ♀; of ovipositor, 30mm. ♀.

This species occurs on thorns and spiny shrubs in July round Madrid, extending as far as Alcalà, Ucles and Ciudad Real. It is doubtfully recorded from Troia in Portugal. Father Pantel observes that specimens occurring on *Scolymus hispanicus* are green.

2. PLATYSTOLUS MARTINEZI, Bolivar.

Distinguished by the unspotted femora on unspined abdomen. Length of body, 36mm.-38mm. ♀ and ♂; of pronotum, 9mm. ♂ and ♀; of posterior femora, 22mm.-23mm. ♂ and ♀; ovipositor, 28mm. ♀.

Common round Madrid, extending as far north as Valladolid. Bolivar notes that specimens from San Martin de Valdeiglesias in July were crammed with *Gordius*: these were all found on perfectly dry and arid ground. The natives call them "Papahigos."

Genus: PYCNOGASTER, Graells.

This genus includes large, plump, apterous grasshoppers, differing from the preceding in the absence of the apical spine on the inner border of the posterior tibiæ; the pronotum is flat above, with a keel on each side which extends from the anterior to the posterior border, separating the disc from the side flaps. The prosternum has two spines.

In Europe, the genus is confined to Spain, and the discrimination of the species is difficult.

TABLE OF SPECIES.

- | | |
|-----------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|
| 1. Side flaps of pronotum entire, broadly rounded behind, where they are higher than in front; colour very varied | 1. GRAELLSI, Bol. |
| 1.1. Side flaps of pronotum emarginate beneath in the middle, no higher posteriorly than anteriorly; colour bronzy-grey, or greenish. | |
| 2. Lower border of dorsal segments of abdomen covered with little long shining bright spots .. | 2. FINOTI, Bol. |
| 2.2. Hinder border of dorsal segments of abdomen smooth or with a stripe or broad margin rather shining and but little rugose. | |
| 3. Posterior femora armed with a few spines beneath near the apex; tibiæ smooth above, or slightly sulcate with borders almost or entirely unarmed. | |
| 4. Pronotum with lateral keels not compressed, almost straight and parallel; side flaps with an emargination in the middle only | 3. INERMIS, Rambur. |
| 4.4. Pronotum with lateral keels compressed and slightly diverging, the lower border of side flaps with two emarginations .. | 4. SANCHEZ-GOMEZI, Bol. |
| 3.3. Posterior femora unarmed; tibiæ with the edges spined. | |
| 4. Keels of pronotum almost straight. | |

- | | |
|------------------------------------------------------------------------------------------------------------------------|-----------------------|
| 5. Pronotum with rectangular emargination on posterior border; infra-anal plate ♂ rounded behind; ovipositor curved .. | 5. CUCULLATUS, Charp. |
| 5.5. Pronotum with obtuse angular emargination posteriorly; infra-anal plate ♂ emarginate behind; ovipositor straight. | |
| 6. Ovipositor rather long (32mm.); feet somewhat long and slender | 6. BOLIVARI, Brunner. |
| 6.6. Ovipositor shorter (27mm.); feet shorter and stouter | 7. BREVIPES, Navas. |
| 4.4. Keels of pronotum curved | 8. JUGICOLA, Graells. |

1. PYCNOGASTER GRÆLLSI, Bolivar.

Distinguished by its smaller size, reddish-brown colour, varied with yellow or green, with grey spots and yellow ones, and also with broad ochre-yellow stripes; also by the side flaps of the pronotum which are entire, not emarginate beneath, and higher posteriorly than anteriorly. Length of body, 28mm. ♂, 30mm. ♀; of pronotum, 11mm. ♂, 10.5mm. ♀; of posterior femora, 14mm. ♂ and ♀; of ovipositor, 27mm. ♀.

A native of almost the whole of the Province of Ciudad Real, and part of the Province of Cuenca, in central Spain.

2. PYCNOGASTER FINOTI, Bol.

Characterised by the series of wrinkles or little furrows, bright and shining, on the latter part of the dorsal segments of the abdomen; the type form occurs only in Algeria, but the var. *gaditanus*, Bol., is recorded from Chiclana, in southern Spain; in this variety the side flaps of the pronotum are not widened posteriorly, the cerci of the ♂ are very slender and pointed apically, the subgenital lamina of the ♀ is emarginate posteriorly, with a deep sulcus oblique on each side; the ovipositor is somewhat curved. Length of body, 40mm. ♂ and ♀; of pronotum ?; of posterior femora, 19mm. ♂ and ♀; of ovipositor, 37mm. ♀.

3. PYCNOGASTER INERMIS, Rambur.

Distinguished from the following by the form of the pronotum, as shown in the Table of Genera. Further, the spines of the posterior femora are very small; the posterior tibiae are rather spiny along the whole of the inner border; the cerci of the ♂ have an inner tooth placed near the apex, which is very obtuse. The supra-anal pale plate of the ♂ is triangular, and longer than broad at the base. Length of body, 34mm. ♂, 40mm. ♀; of pronotum, 12mm. ♂ and ♀; of posterior femora, 18mm. ♂ and ♀; of ovipositor, 37mm. ♀.

Peculiar to the Sierra Nevada.

The egg and egg-laying of *Ourapteryx sambucaria*, with a remark on upright Geometrid eggs.

By J. W. TUTT, F.E.S.

On the evening of July 9th, at about 10.30 p.m., a fine ♀ *Ourapteryx sambucaria* was sitting on a privet-leaf in one of the little front gardens of a house in Westcombe Hill. It was raining hard, but the moth sat unconcerned upright on the leaf with its wings over its back, so I carried it indoors and placed it under a glass, and in the morning it had laid a considerable number of eggs, all on the edge of the glass,

just clear of where the latter touched the sheet of paper on which it stood, and the number has been added to since until today (July 12th), when there are apparently about 300 eggs.

They are laid chiefly in little batches of from 5 to 25 apiece, some, however, singly. The remarkable point about the eggs, however, is that they are highly specialised upright eggs, the micropylar axis being quite perpendicular to the surface on which they are deposited. They are bright yellow in colour, and might, so far as their general appearance is concerned, be Satyrid or Nymphalid eggs, being circular in transverse and broadly oval in longitudinal section, the base wider than the apex, pale yellow in colour, indeed, not greatly unlike the tint of the imaginal scales. The egg is distinctly ribbed from the base to the micropylar area, with about 16 longitudinal keels, the edge of each keel looking somewhat smooth and shining, with a noticeable iridescence under a low power (hand-lens); between these are a number of transverse lineations surrounding the egg, so that the whole of the ovum has a peculiar butterfly-egg aspect.

All the eggs appear to be laid in this position except one; this one is the only one that is off the glass, and is on the paper on which the glass stood, *i.e.*, all are laid as upright eggs on a vertical surface, and the odd one is laid as a flat egg on a horizontal surface. This, laid on its side, has, as it were, the base of the egg higher than the apex, owing to its being thicker at that end. The egg is apparently quite unsuited for being laid in this position.

The Geometrid egg that most resembles this in its manner of being laid is that of *Dasydia obfuscata*. Yet the supposed allied Gnophids have most normally-shaped flat eggs, which differ, not only in position, but in shape, method and style of ornamentation, and, structure to such an extent that one wonders what so great a difference indicates.

Then there are some of the Acidaliids that lay upright eggs, but here we find a good deal of transition, some ♀s laying, in confinement at least, a fair percentage of eggs in flat and in upright position, and, besides, the structure of these upright laid eggs is less distinctive, and appears much rather that of a flat egg on end than a bona-fide upright egg of circular transverse section. The eggs of *Dasydia obfuscata* and *Ourapteryx sambucaria*, which are very unlike, and which two insects have no real close alliance, appear to have developed *per saltum* as highly specialised eggs of a type common in the Noctuo-Papilionid stirps, but very rare outside it.

There are, I suspect, other genuine upright eggs among the Geometrids. These ought to be carefully studied. The evolution of the Coleophorid egg in its generalised and specialised forms, although already noted, still demands attention. Dr. Chapman has shown us special evolutive directions in which eggs of other so-called "micro" groups have upright eggs. Still there are so many men who collect and rear "Geometrids," compared with those who rear the "micros," that one might reasonably expect additional knowledge on all points relating to the biology of the Geometrids.

On the morning of July 23rd the ♀ died. She had laid 547 eggs. The earliest laid eggs were now of a very deep orange colour, through which they had passed by a series of different shades of orange from their first yellow tint. Only 28 eggs altogether were laid on the paper on which the glass under which the ♀ was confined, and of these

deposited on a horizontal surface, the eggs of one little batch of eight are placed upright, two of a batch of four almost so, the others being laid horizontally. All the other eggs were laid round the lower edge of the glass, all within a half-inch of the bottom, in a few cases some overlaid the others, possibly because the ♀ could not get a hold on the glass higher up to lay them in their natural upright position on a vertical surface. One batch numbered above 90, but these may have been laid at various times and not all at one sitting. It is worth noting that the ♀ was in absolutely perfect condition at the time she died, the confinement in a rather small glass not having led her to damage herself at all. Two eggs, possibly infertile, remain yellow. They may, of course, have only been just laid.

The courtship of *Hepialus humuli*.

By LT.-COL. MANDERS, R.A.M.C., F.E.S., ETC.

The insect usually emerges from the pupa at about 6.30 p.m.-7.0 p.m., and probably pairs the same evening. I say this, as, in my experience, pairing of butterflies and moths takes place as soon as the female is mature.

On June 25th, I noticed a male hovering in the usual well-known manner for quite five minutes over the same patch of grass, but, being accompanied by an impatient entomological friend, I was unable to further investigate. However, the following evening I found what I believe to have been the same insect hovering in the same spot, and I watched him carefully from 9.30 p.m.-9.45 p.m., during which time he never shifted his position.

I was under the impression that he was attracted by a female lurking in the grass, or, possibly, by an empty pupa-case which had contained a female insect. But it was not so! for, while he continued thus, a female from up-wind, or, strictly speaking, from his half left front, joined him, and, after toying together for half a minute or so, they flew against the wind, the female leading. After flying thus for a few yards the female settled on a grass stalk, but the male passed on and lost her, and commenced again to hover. In half a minute she flew up and joined him again, when the same process was repeated; for thrice the male missed her, but, on the fourth occasion, a gust of wind blew him backwards, when he joined her in the grass and coupling took place. There is no doubt that, in this case, the female sought the male, contrary to the usually received notions regarding the pairing of insects, and I am inclined to think, as in the case of the *Ornithoptera*, that the female takes a more prominent part in courtship than is usually imagined.

I remember Dr. Chapman writing an interesting note on his observations on this insect, but I have purposely refrained from looking up the reference in order that I may give an unbiassed account of the phenomenon as I saw it. Both insects were in perfect condition.

Hybrid Sphingids.

By J. W. TUTT, F.E.S.

The study of hybridity in lepidoptera has not yet produced a real specialist in Britain, although Mr. Newman has paid some attention

to the subject, without, however, publishing anything thereon; but for the student who will devote his time largely to the matter we still wait.

At the recent exhibition of the Société Lépidopterologique de Genève, the following Sphingid hybrids were exhibited by my friend Dr. Denso. The nomenclature looks somewhat formidable, but reference to *Nat. Hist. Brit. Lep.*, v., pp. 23-24, will aid in its simplification, as will also remembrance of the fact that *austauti* is merely the large Algerian form of *populi*, and *atlanticus* that of *ocellata*. The specimens shown were—

5 ♂ hybr. *austauti* ♂ × *atlanticus* ♀ = *metis**, Aust. (among which was the type of the ab. *deleta*, Aust.).

1 ♂ hybr. *atlanticus* ♂ × *austauti* ♀ = *oberthueri*†, Tutt.

2 ♂, 2 ♀ mongr. *austauti* × *populi* ♀ = *darwiniana*‡, Stdfss.

2 ♂, 2 ♀ mongr. *populi* ♂ × *austauti* ♀ = *fangi*§, Stdfss.

2 ♂ hybr. *austauti* ♂ × *ocellata* ♀ = *varians*§§, Stdfss.

2 ♂, 1 ♀ hybr. *ocellata* ♂ × *austauti* ♀ = *operosa*||, Stdfss.

6 ♂ hybr. *ocellata* ♂ × *populi* ♀ = *hybridus*, Stphs. (not *hybrida*, Westd. as noted).

1 ♂ hybr. *ocellata* ♂ × (*populi* ♂ × *austauti* ♀) ♀ = *daubii*¶, Stdfss.

1 ♂ hybr. *atlanticus* ♂ × *populi* ♀ = *fringsi*** , Stdfss.

1 ♂, 2 ♀ hybr. *ocellata* ♂ × *exaeca* ♀ = *neopalearctica*, Stdfss.

1 ♂ hybr. *tiliae* ♂ × *ocellata* ♀ = *leoniae*, Stdfss.

It has been deemed advisable to note these separately, as the nomenclature looks intricate, and to anyone not quite conversant, misleading. There are, as a matter of fact, only four hybrids here, viz. :—

hybr. *hybridus*, Stphs. (= *ocellata* ♂ × *populi* ♀ = *atlanticus* ♂ × *austauti* ♀ = *ocellata* ♂ × *austauti* ♀ = *atlanticus* ♂ × *populi* ♀, etc.). [*Atlanticus* is specifically identical with *ocellata* and *austauti* with *populi*].

hybr. *inversa*, Tutt (= *populi* ♂ × *ocellata* ♀ = *austauti* ♂ × *atlanticus* ♀ = *populi* ♂ × *atlanticus* ♀ = *austauti* ♂ × *ocellata* ♀).

hybr. *neopalearctica*, Stdfss. (= *ocellata* ♂ × *exaeca* ♀).

hybr. *leoniae*, Stdfss. (= *tiliae* ♂ × *ocellata* ♀).

We are not altogether free from helping to form this muddled synonymy ourselves, but it is quite clear that there can only be one available name for the same hybrid, e.g., hybr. *hybridus*, Stphs., for the cross between *ocellata* ♂ × *populi* ♀, etc. The crosses of local forms of these species *inter se*, or of one local form with the type form of the other species leaves the actual hybrid unaltered. The special race may produce a different-looking insect—but if a special name be given, it can only be as a variety of the primary hybrid of the two species, thus *oberthueri*, Tutt, *operosa*, Stdfss., *daubii*, Stdfss., *fringsi*, Stdfss., are at the most forms or varieties of the hybr. *hybridus*, Stphs. Similarly, *metis*, Stdfss., is merely a var. of the hybr. *inversa*, Tutt. This

* Since *austauti* = *populi* as a species, and *atlanticus* = *ocellata* as a species, it follows that *metis*, Stdfss. = *inversa*, Tutt, both having the same parentage (see *N. Hist. Brit. Lep.*, v., p. 24).

† Similarly *oberthueri*, Tutt = *hybridus*, Stphs. (op. cit. p. 23). Dr. Denso calls this *hybrida*, Westd., but Stephens named it, not Westwood (see *N. Hist. Br. Lep.*, iii., p. 448).

‡ As these are merely crosses between local races of the same species, they are "mongrels," not "hybrids."

§ Since *austauti* = *populi* as a species, therefore *varians*, Stdfss. = *inversa*, Tutt.

|| Similarly *operosa*, Stdfss. = *hybridus*, Stphs.

¶ This is really a cross between *ocellata* × *populi* and hence = *hybridus*, Stphs.

** This is again only *hybridus*, Stphs., since *atlanticus* = *ocellata*.

may make matters clear to those of our biologists who are studying the subject, and may not find all these Standfussian names in our chapter of "Hybridisation in Lepidoptera," *Nat. Hist. Brit. Lep.*, v., pp. 1-39. As to the mongrels noted above, Dr. Denso calls them hybrids, and writes: "We do not, in Switzerland, adopt the name mongrel," etc., but it is quite clear that a cross between two forms of the same species is a mongrel, and of a quite different biological value from that of a hybrid which is a cross between two distinct species.

The Phryxid species were also well represented. Dr. Denso exhibited 38 examples, as follows:—

- 2 ♂, 1 ♀ hybr. *euphorbiae* ♂ × *vespertilio* ♀ = *epilobii*, Bdv.
 4 ♂, 2 ♀ hybr. *vespertilio* ♂ × *euphorbiae* ♀ = *densoi*, Musch.
 1 ♂ sec. hybr. *epilobii* ♂ × *vespertilio* ♀ = *eugeni*,* Mory } In natura
 1 ♂ sec. hybr. *eugeni* ♂ × *vespertilio* ♀ = *lippei*,* Mory } captæ.
 3 ♂, 1 ♀ sec. hybr. *epilobii* ♂ × *euphorbiae* ♀ = *pernoldiana*, Aust. (among which are Austaut's two types).
 series ♂ mongr. *dahlia* ♂ × *euphorbiae* ♀ = *wetteri*,|| Turati.
 2 ♂ mongr. *euphorbiae* ♂ × *dahlia* ♀ = *giesekingi*,|| Turati (only examples known).
 1 ♂ hybr. *elpenor* ♂ × *porcellus* ♀ = *luciens*, Dso.† (specimen unique; taken wild).
 1 ♂ hybr. *euphorbiae* ♂ × *elpenor* ♀ = *harmuthi*, Kordesch.
 1 ♂ hybr. *elpenor* ♂ × *euphorbiae* ♀ = *pernoldi*, Jacobs.
 1 ♂ hybr. *gallii* ♂ × *elpenor* ♀ = *gschwandneri*, Kordesch.
 1 ♂ hybr. *gallii* ♂ × *vespertilio* ♀ = *gillyi*, Gilly.
 series hybr. *gallii* ♂ × *euphorbiae* ♀ = *phileuphorbia*,† Mütz.

It would be well if the subscribers to *Nat. Hist. Brit. Lepidoptera* obtained an extra copy of this list and inserted it in vol. v., p. 38, to keep the catalogue there up-to-date.

* No proof has yet been offered of the parentage of these hybrids, which is largely speculative so far; see *Nat. Hist. Brit. Lep.*, v., p. 24.

|| Whether these are hybrids or mongrels must depend upon the specific value of *dahlia*. Most authorities now consider *dahlia* to be only a local form of *euphorbia*, in which case these are mongrels not hybrids.

† Proof of parentage also wanted in this case.

‡ Denso calls this *galiphorbiae*, but it must be referred to *phileuphorbia*, Mütz., on the assumption of the parentage of Mützell's example being accurate, see *Nat. Hist. Brit. Lep.*, v. pp. 24, 38.

Billberg's Geometrid Genera.

By LOUIS B. PROUT, F.E.S.

Through the great kindness of Mrs. C. H. Fernald and Mr. J. H. Durrant, who (by a strange coincidence) have simultaneously sent me M.S. copies of the Geometrid portion of Billberg's very rare "Enumeratio Insectorum in Museo Gust. Joh. Billberg" (Stockholm, 1820), I am able at length to fill in what has been the only serious hiatus in my bibliography of this family. Whatever divergent views are held as to the validity of Billberg's work, I do not find that he added anything material to Geometrid classification, and, as each of his genera contained the type of an earlier genus, their names must be viewed in every case as "n. nom." rather than "n. gen."; and as, further, none of the names which he rejected were preoccupied, his own are unnecessary. For the most part he admittedly adopted Leach's 1815 scheme (*Edinb. Encycl.*), and rule *f* on Art. 30 of the "International Code" of Nomenclature (see *Science*, October 18th, 1907, p. 521) seems to be applicable; but, in any case where this may

not be so, I claim the right to "select a type" in the same sense demanded by rule *g* (Art. 30), and I trust the following list will prevent future complications in dealing with Billberg:—

† *Uraptera*, Billb., Enum. Ins., 88. Type *sambucaria*, Linn. (= *Ourapteryx*, Leach).

* *Phalaena*, Billb., ibid. 89. Type *grossulariata*, Linn. (= *Abraxas*, Leach).

|| *Erichia*, Billb., ibid. Type ? (= *Herminia*, Latr. (not Geometrid).

Ciliz, Leach, Billb., ibid. Type *glaucata*, Scop. (not Geometrid).

Drepana, Schrank, Billb., ibid. Type *binaria*, Hufn. (not Geometrid).

Geometra, Linn., Billb. restr., ibid. Type *syringaria*, Linn. (= *Phalaena*, Linn., Fabr. restr., which many authors consider invalid as a genus.)

|| *Dasyphara*, Billb., ibid. Type *strataria*, Hufn. (= *Biston*, Leach).

|| *Phaophyga*, Billb., ibid. Type *pinaria*, Linn. (= *Bupalus*, Leach).

|| *Tribacis*, Billb., ibid. Type *margaritata*, Linn. (= *Campaea*, Lam.)

|| *Leptornis*, Billb., ibid. 90. Type *papilionaria*, Linn. (*Hipparchus*, Leach).

The signs preceding the names are in accordance with the Merton Rules, viz.: = a synonym; * = invalid, as not containing the type of the conception; † = wrongly written.

The lepidoptera of the Grisons—Predä and The Albula.

By J. W. TUTT, F.E.S.

The morning of August 18th, 1907, broke cloudless, but there was a nip in the air which was in consonance with the snow that was lying low on all the mountains around. The last week of broken weather had been spent in the land of the butterfly "tripper," but here, one was on classic ground. Long had we hoped to see the country between Bergün and the summit of the Albula. For years, ever since we had begun to study the "plumes," the names of the favourite corners between Bergün and the Albula summit, that Zeller so dearly loved—"Predä," "the Weissenstein," and so on—had been familiar, for it was here that much of our present knowledge of "plumes" was gained by the past-master of our craft when he spent the three summers of 1871, 1873, and 1875 on this excellent collecting ground, and here was I at Predä. But I felt an outsider, remaining here only for a day or two, and dependent on the weather of those days to see the country that Zeller hunted so long and so closely. However, the Fates were so far kind that I got two splendid days here, for, on the 19th, the ground of the 18th was more carefully covered, and, before I had unfurled my net, many interesting species were seen on the rough slopes outside the inn and railway. Slowly and carefully working upwards, I was much struck with the excellent appearance of the country for lepidoptera, not so much for butterflies, but rather in the "down" nature of many of the slopes and flats, covered with short grass and an abundance of flowers, that reminded one much of our Kentish downs, for, as a rule, the Alps are not strong in Microlepidoptera, but here were possibilities of which we knew Zeller had long since had complete knowledge, and of which he had taken full advantage. But these are the notes of a "tripper," and anything fuller that may have been obtained will appear in due course, in connection with our more comprehensive account of the butterfly species noted. Directly outside the inn, *Brenthis ino* and *B. amathusia* were as abundant as *Argynnis aglaia* and *A. niobe*, but the limit of the two first-named species appeared to be not much more than 500ft. elevation above Predä, i.e., the region of the trees above the inn. About this lower ground,

coltsfoot was abundant, and an odd example of *Platyptilia gonodactyla* started from the herbage led us to work closely, coming down in the afternoon with the result of obtaining a long series of very large examples of this species. It occurred all the way to the Weissenstein Inn, whence Zeller recorded it August 2nd, 1871. Over the alders came a freshly-emerged *Gonepteryx rhamni*, settling directly on a flower-head, and sidling under the blossom in most approved fashion, the only one seen.

Of the *Erebias* of the lower level, *Erebia manto* was going over, which I regretted, *Erebia euryale* was fully out, an occasional ♀ with orange instead of fulvous blotches on the upperside of the forewings (=ab. *pallida*), *Erebia goante* just outside the inn appeared to fail almost entirely higher up, whilst *E. tyndarus*, the males particularly slaty and hoary on the undersides, the ♀ dark grey, with broadish median band of brownish tint was abundant; *Melampias melampus* also occurred, little enough one might say. The delight of this ground, however, was *Erebia pronoe* var. *pitho*, a most delightful race, in the pink of condition, just out. They were almost as black and velvety as the grandest *glacialis*, the ♂s with the upperside uniform, and scarcely a trace of fulvous about the apical dots, hardly as large as the Faucille examples, which are the biggest and blackest *pitho* I know, but of almost the same sooty shade; in the ♀s the fulvous was slightly more developed, but the spots were still small. The underside of the hindwings of the ♂ were delicately purple, some with a very dark median transverse band, those of the ♀ different from any that I had seen before—the greater number ochreous, with a brownish median band shading off into the rather darker base = ab. *ochracea*, n. ab., others with the darker brownish median band conspicuously contrasting with the outer and basal areas = ab. *virgata*, n. ab., the rarer form whitish-grey (almost whitish-violet) with a similar brown median band = ab. *pallescens*, n. ab., the two last-named forms being almost exactly parallel with the abs. *ochracea* and *leucotaenia* of *E. aethiops*. The habits of the two sexes were entirely different. The ♂s swarmed on the paths, or by the hot walls, fluttered up and down the slopes, or battled at the flowers. The ♀s lay low, and had to be walked up, no easy matter on the steep slopes they haunted, but they were worth all the work spent in getting them. The race itself appears to be much nearer the Jura than the Simplon or Tyrolean forms. The *E. manto*, on the other hand, were much nearer the Tyrolean (St. Anton and Innsbruck) forms than any other we have represented in our collection, showing, however, a variable amount of fulvous on the forewings. The *E. euryale* also tended to the dark median banded form beneath, with the red-brown conspicuously banded on either side with clear ochreous, ab. *virgata*, n. ab., the underside of the hindwing, in fact, being crossed by (1) outer marginal red-brown band; (2) wide clear ochreous band; (3) broad dark red-brown band; (4) ochreous basal area shading to brown at base. A marshy slope provided an abundance of *Brenthis pales*, of which the ♀s were mostly brown, of a tint approaching the ♂s, but a few were of the *napaeae* form, except that the paler areas have a distinct whitish or bleached appearance = ab. *pallida*, n. ab., whilst some of the ♂s have a particularly yellow-orange, rather than fulvous, tint. Here, too, a couple of *Chrysophanus hippothoe* ♂s were found, still in fair condition. On the *Vaccinium*-covered slopes *Cidaria populata* swarmed, whilst *Euthemonia russula* was repeatedly walked up, and among the

grass *Coenonympha satyrion* was not uncommon, but going over. The whiteness of the underside band was very marked, and, although on the marshy ground it was not noticed that the spotting in this band was scanty, yet on the slopes it was so, and one or two beautiful ab. *impunctata*, Obth. (*caeca*, Wh.), were captured. From the lovely Lake Palpuogna to the Weissenstein Inn is a marvellous piece of collecting ground. One wants to get well up on the steep banks to get the full value of them, and here, too, were gallons of ripe bilberries, of which also we took full advantage. Here on one workable flat piece of ground *Adkinia coprodactyla* was found, difficult at first, owing to its uniformity of tint, to name with certainty, but a fair series was captured. Here, among other things, too, were *Heodes virgaureae*, the ♀s dark, but the ground colour golden, and not of the *zermattensis* hue. *Melitaea dictynna* going over, the only Melitæid observed, and, buzzing in the sun, a ♂ *Malacosoma alpicola*, of which a pair, in copulâ, were afterwards picked up. There were several blue butterflies on this bank, the ♂s, however, much more frequent at the runnels on the path. These included *Agriades corydon*, *Plebeius argyrognomon* (*argus*), *Polyommatus eros*, *P. orbitulus*, *Cyaniris semiargus*, and, near the inn, quite a number of *Cupido minimus*, mostly worn, but some in fine condition, and, on the big heads of *Anthyllis*, the eggs were soon discovered. A single large ♂ *Polyommatus icarus* was taken, and near the inn a single ♂ *Agriades bellargus*, a most interesting take at this elevation. Here also were some worn *Loweia subalpina*. At the Weissenstein inn, a mere relic now of the old coaching days, the streams from the neighbouring mountains form many marshy flats, and here *Parnassius delius* flies, spread over a large area, but apparently nowhere abundant. All along the road *Hesperia alveus* and *Urbicula comma* are frequent, but nothing that could be referred to *H. andromedæ*, which is reported to occur here, was found. *Issoria lathonia*, *Aglais urticae*, and *Colias phicomone* had been on view all the way, but here, at the inn, the first examples of *Colias palaeno* and *Melampias epiphron* were observed. Many of the purely alpine species continued, but one had to get well on between the inn and the Hospice, before the last species of the district were reached; then a fine large black *Erebia* swung over from the slopes, the fuscous patch somewhat dull, and we have our first *E. glacialis*; the small black *Erebias* on the flowering slopes are *Erebia gorge*, mostly worn, whilst the *E. lappona* were mere rags. The slopes behind the Hospice, and not on the side of the road, appear to be the most prolific, and the lovely mountain-flowers, violas, caryophylls, etc., are delightful. Up to the Hospice, giant *Pieris rapæ* were occasionally seen on the wing, whilst beyond, at the summit of the Pass, a fine large fresh ♀, *P. brassicae*, was taken, and again *Parnassius delius* appeared; *Polyommatus pheretes* seemed to be generally distributed over all the higher slopes. On the 18th, our boxes were all filled with the captures of the day by 2 p.m., and, as the clouds came up and the sun was repeatedly obscured, we returned fairly early to the setting, but the 19th was a perfect day, and was spent between Predä and the lovely source of the Albula, just beyond which, at about 7000ft. elevation, we took a very good example of *Brenthis euphrosyne* on a thyme flower. But almost three hours in the late afternoon was spent on the slopes below the Weissenstein Inn. Hardly a breath of air was stirring, and the Geometrids and Phycitids knew it. *Gnophos obfuscata*, the males tremendously

large and leaden, were on every blossom, whilst *Larentia apicata*, *L. caesiata*, *Melanippe montanata*, and *Carsia imbutata* were frequently noted. *Scopula alpinalis* and *S. phrygialis*, *Setina irrorella* (no *S. aurita*), *Hypercallia christiennana*, *Thera simulata*, and other species were noted. The only *Anthrocera* on these banks was *A. achilleae*, but the species was infrequent, and, although some of the species had a small apical spot (as in Zeller's from Bergün), others were pretty typical. *Merrineldia tridactyla* (*tetradactyla*) flitted freely over the grass where thyme grew; *Adkinia coprodactyla* was fairly common, whilst *Crambus conchellus* was often noticed. Several species I cannot name offhand, and these must stand over, but the two lovely days had produced an excellent bag, and given a hint of at least one corner of Zeller's favourite haunt. Next day we would go to Bergün, at least one day must be spent between Preda and Bergün, and the morning broke delightfully, yet before 7 a.m. it was clear that the day was going to be hopeless; dense cold fog drifted up the valley, the bright scene that I had witnessed a few minutes before was blotted out, and the temperature fell at least 10° to 20° in a few minutes. I went on setting and packing all the morning, and at last recognised that my holiday had come to an end. In the afternoon I was at the station, and went through Bergün in fog, which had changed to blinding rain by the time we arrived at Tiefenkastel, and we were glad enough when Thusis was reached. Somewhat dissatisfied then with the scurvy treatment meted out to us, because of the complete failure of our hopes so far as regarded collecting between Preda and Bergün, we can now look back to our short stay on the Albula as comprising two of the most lovely collecting days that we have spent among the summits of the high alps.

A few Notes on *Cryptocephali*.

By H. ST. J. K. DONISTHORPE, F.Z.S., F.E.S.

Having taken a good many of our species of *Cryptocephalus* this year, a few notes on them may be of interest. All the species lay a covered egg, as *Clythra* and *Labidostomis* do, and I collected many of these eggs (*Gynandrophthalma affinis* also lays a similar egg, and I have obtained and had figured the covered egg of this species) which they let fall. The larva, when hatched, builds a larval case on to this egg-case, and those that I have been able to observe feed on lichen on trees. Dr. Chapman sent me a larva in a case, taken on lichen on a tree in the New Forest. This pupated, and when it hatched it proved to be *C. parvulus*. Some have been recorded to pupate in ants' nests, though I personally have never found any in such places. The perfect insects are taken by sweeping, and on bushes and trees, young oaks, hazels, birches, etc., and feed on the leaves, consequently where the perfect insects occur has nothing to do with the habitat of the larvæ.

CRYPTOCEPHALUS BIPUNCTATUS, L.—It will be remembered that last year my friend Mr. Mitford swept a pair of this species at Niton, in the Isle of Wight. Not enough was made of this discovery, as it was practically an addition to the British list, only the vars. *lineola*, F., and *thompsoni*, Weise, having been found up to then in Britain. One of Mr. Mitford's specimens has the elytra almost entirely red, and the

other has a small black spot on each elytron. He kindly told me whereabouts he obtained them, and I went down in July to endeavour to find more. After a long and strenuous hunt I ran the species down to its head-quarters, in a grassy place some little distance from the original spot, and swept up over 30 specimens. Many more could have been taken, as when tired I lay on the ground and watched the beetles coming up on the grass stems, etc. I obtained some specimens like Mr. Mitford's, but the majority had four black spots, two on each elytron. Some had these spots confluent, but nothing like the thick black band, as in *C. lineola*.

C. LINEOLA, F.—Professor Beare and I beat this form from hazel, and swept it off the “rock-rose” in Oxfordshire, whilst Commander Walker tells me that it was not uncommon in the New Forest.

C. SEXPUNCTATUS, L.—On June 15th I beat a specimen of this beautiful species off birch, in Darenth Wood, where it used to occur, but has not been taken there for some years. Subsequently Mr. Pool went down and captured another specimen off birch. As there were three other coleopterists also hunting for it, and only one specimen taken, this led him to think they were not on the right track, and on a further visit he ran it down on young hazels, and several of us eventually obtained our series.

C. PUNCTIGER, PK.—I beat a nice little series of this species from birch, at Darenth Wood, in June, though it was decidedly rare.

C. MORAEI, L.—Whilst staying with my friend Mr. Hereward Dollman, at Ditchling, in July, he swept two specimens of this off *Hypericum* on the Downs, in both of which the spots on the elytra are bright red, instead of the usual whitish-yellow colour, a most beautiful and striking form.

C. QUERCETI, SUF.—I completed my series of this species by beating low branches of oaks in Sherwood Forest, though it was getting late for it, and the beetle was nearly over for the year. I believe the better species are only on for a quite short time.

C. EXIGUUS, SCHR.—I made a flying visit to Lincolnshire in July, and, in company with Dr. Wallace, swept up a nice series of this rarity in a bog near St. Coats. It occurred on a thistle and by general sweeping, and not on, or near, any of the salallows or willows. It was in greater numbers than it had ever been taken there before. It is an interesting fact that the common *labiatus*, to which it bears a strong resemblance, does not occur on this bog. I have also taken this year *aureolus*, Suf., *ochrostoma*, Har., *parvulus*, Müll., *bilineatus*, L., *fulvus*, Goez., *pusillus*, F., and *labiatus*, L.

Forest Entomology.*

“Forest Entomology” is the title of a book that has just been sent us for review. If one says that it is sometimes inaccurate as to fact, poor in style, very limited in its extent, and, as a result, not likely to be of much service to anyone, one has probably left out of account those whose acquaintance with entomology is absolutely *nil*, and who may want some knowledge of the subject, whilst, on the other hand, if one

* “Forest Entomology,” by A. T. Gillanders, F.E.S., 422 pp., 351 illustrations. [William Blackwood & Sons, Edinburgh and London. Price 15s. net.]

judges it from the standpoint of the well-informed entomologist, one wonders what one can say in its favour. The author, in his preface, says that he "submits the knowledge contained in the book with a feeling that he has just about the necessary amount of knowledge to make a beginning rather than a finish," and this is so obvious, that it seems a pity that, recognising the fact, he did not wait until he had obtained the knowledge necessary to bring the work to a successful issue. He further states that "the Germans are our great teachers in this branch of knowledge," a remark that may be true, although we do not feel at all anxious to be taught in the particular way that our author has learned, nor have we yet discovered that the advanced German entomologist is in any way ahead of his well-informed British confrère, nor do we think that he himself would suggest he was.

We have carefully looked through the chapters of this book that should have afforded us some interesting reading. One is entitled "Hymenoptera—Oakgalls," and is introduced by quotations from Adler, Darwin, Romanes, Cockerell, Cameron, etc. The rest of the material is most meagre, and nothing appears to have been referred to later than Cameron's "Monograph of the British Phytophagous Hymenoptera" (1889). Taking one species at random, the author notes (p. 147) of *Neuroterus (Spathogaster) aprilinus*:

"The galls of the species are formed in buds, but the formation is so obscure as to be frequently overlooked. In fact, we should consider them abortive buds, and the best way to find them is to look for abortive buds just after the leaves develop. It should be noted that undeveloped buds, frequently found in oaks after the early flushing of the leaves, are due to the attacks of this species. In order to hatch these galls it is best to collect them about the end of April or beginning of May.

Now one is constrained to ask what is the use of this information—(1) from a biologic, (2) from an economic, point of view. The life-history of this insect has been excellently recorded by Dr. T. A. Chapman (*Ent. Rec.*, vi., pp. 245-8), whilst the evidence suggesting *Neuroterus schlechtendali* as the summer gall of the same insect is also lucidly set forth. Taking a line through this insect one cannot think too highly of the information presented, nor of the up-to-datedness of that information.

Another chapter is entitled "Lepidoptera (Moths)." The species dealt with are—*Smerinthus populi*, *S. ocellatus*, *Trochilium bembeciformis*, *Cossus ligniperda*, *Zeuzera aesculi*, *Orygia antiqua*, *Dicranura vinula*, *Pygaera bucephala*, *Fidonia piniaria*, *Cheimatobia brumata*, *Hybernina defoliaria*, *Trachea piniperda*, *Dioryctria abietella*, *Tortrix viridana*, *T. ribeana*, *Penthina pruniana*, *Hedya ocellana*, *Batodes angustiorana*, *Paedisca occultana*, *P. ophthalmicana*, *Stigmonota regiana*, *Retinia turionana*, *R. buoliana*, *R. resinana*, *Hyponomeuta evonymellus*, *Prays curtisellus*, *Depressaria conterminella*, *D. assimilella*, *Argyresthia laevigatella*, *Gracillaria syringella*, *Colophora laricella*, *C. fuscadinella*, *Lithocolletis messaniella*, *Cemistoma laburnella*.

There are some remarkable statements here for a book that is supposed to have its *raison d'être* in giving exact information as to the damage done to forest-trees and the prevention of such damage, *e.g.*, "the larva of *S. populi* lives on Lombardy and black Italian poplars. . . . As development proceeds the horn is less conspicuous. . . . The life-history and habits of *S. ocellatus* much resemble the preceding

species, and the larva is said to generally feed on the willow and apple, though I have found it feeding on the leaves of the black Italian poplar." The larvæ of *Cossus ligniperda* "live for about three or four years in the larval stage." *Zeuzera aesculi* "is said to live from two to three years in the larval stage." "I have not found *Orgyia antiqua* so numerically strong as to be considered a serious pest." "The caterpillars of *Cerura vinula* are sometimes very injurious to willow and poplar." "The larvæ of *Pygaera bucephala* often do considerable damage to various forest-trees by feeding on the leaves of elm, oak and other trees; in some cases, oak-trees have been quite defoliated." "The larvæ of *Trachea piniperda* feed on the twigs of Scots pine-trees." "The larvæ of *Dioryctria abietella* are injurious to the cones of the spruce-fir and silver-fir. This species belongs to the family of Crambites, the typical moths of the same may be seen flying or rather leaping on the grass fields, in a summer evening walk." When the larva of *Hedya ocellana* "injures the leading shoot of *Populus argentea*, considerable damage is done to young woods." "The terminal shoots of a holly hedge are often drawn together by a small silken thread, thus forming a sort of rosette, each rosette tenanted by a single caterpillar of *Paedisca ophthalmicana*." "*Hyponomeuta evonymellus* is found on bird-cherry and spindle-tree," etc.

There is no need to discuss such statements as these, which, when not absolutely erroneous, can be of no possible service to anyone. Entomologically, of course, they are hopeless; and their value may explain the author's statement (p. 281) that hitherto the genus *Coleophora* "has not received such special attention from economic entomologists as to assure us that the habits given by naturalists are over-reliable," etc. This suggestion that the knowledge of naturalists must be confirmed by economic entomologists before it can be considered reliable is very funny, yet it seems to be offered in all innocence by the author. Of course, we may admit at once that lepidopterists among other "naturalists" know little of the "habits" of anything, but, judging from the knowledge of "economic entomologists," as set forth in this book, we can assure the author that the latter are not at all likely to surpass the former at any rate for the next century, even if the "economics" keep steadily on, and the "naturalists" do no more. We would refer Mr. Gillanders to some notes on the Coleophorids—*Ent. Rec.*, xviii., pp. 11-12; 41; 65; 103; 118-123; 173, 174; 311, etc. There are very many others, but these will do. If he will turn to p. 311 he will discover something about *Coleophora fuscadinella*, not quite in accordance with his remarks on p. 284. No doubt, if he sent the cases of his unknown birch Coleophorids to any of our specialists, he could get them reliably named.

The book is excellently printed and well got up. We can only regret that the contents are so poor. America has given us the lead in "Economic Entomology"—good, bad, and indifferent. It has shown us how to make a "trade" of it. In Britain, so far, we have escaped. Any interested gardener or agriculturist can always, by reference to any of the reputable entomological magazines, get reliable information on almost any species that interests him. There are books almost three-quarters of a century old far ahead in many respects of "Forest Entomology," and the success of Miss Ormerod was largely due to the fact that, in any trouble, she immediately sought expert ento-

mological advice, and we can assure the author, after all, that at least lepidopterists know more about Lepidoptera than appears on the surface, and that in the *Entomologists' Monthly Magazine*, *The Entomologist*, *The Entomologist's Record*, there are lots of things that he evidently has never seen, or even heard of, that might clear up some of his difficulties.

NOTES ON LIFE-HISTORIES, LARVÆ, &c.

OVUM OF OPHIODES LUNARIS, SCHIFF.—Rather more than a hemisphere, slightly raised at the apex, flat at the base, height 0·8mm., diameter 1·1mm. There are about 25 strong ridges running from the base towards the apex, each of these has a slender rib passing along its summit. Some of the ova had 26 ridges, others only 24. They do not run evenly but in a wavy manner, and about six of them either run into another ridge or cease abruptly as they near the summit. It is interesting to observe how the ridges break down as the micropylar area is approached, like a range of mountains gradually breaking up into isolated hills as the plain is reached. There are also about 30 fine lateral ribs encircling the egg at right angles to the ridges. The general surface is roughly wrinkled. The micropylar area, about 0·2mm. in diameter, is well-defined. The rosette of ten elongated cells is surrounded by more or less semicircular cells, forming three irregular circles. Beyond these the cells gradually become transformed into the ridges. One egg was pale green in colour, but all the other seventeen were deep purple-brown with a broad, irregular ring of pale green about one-third below the apex, and another at the base. [Described end of April, 1906, from ova sent to Mr. Main by Dr. Chapman, from France.]—ALFRED SICH.

NOTES ON THE EARLY STAGES OF HEODES VIRGAUREÆ.—I reared this species, for the first time, eight years ago. MESSRS. Kalwe and Dorries (the latter now eighty-six years of age) told me that they had been unsuccessful, but this had arisen through their want of knowledge that the species hibernated as egg, so that, when the larvæ could not be found in early spring, they cleared out the flower-pots in which the eggs had been placed. However, I kept my eggs longer, and, bringing the growing plant of sorrel into a warm room in January, I patiently waited. The egg of *H. virgaureæ* remains among the rotting leaves and stalks of sorrel, and hibernates thus. In confinement it is best to cover the sorrel on which the eggs have been laid with dry leaves, and leave them thus during the winter; desiccation does not then take place; in January, move the pot into a warm room, and in about twenty-four days the first sign of feeding will be observed on the sorrel leaves, showing that the larvæ have left the eggs in the meantime. At first they make very small, oval, transparent spots on the leaves, but the larvæ are rarely to be observed, for, as soon as they have fed, they hide low down on the stalks. They feed up rapidly, however, and they are not at all difficult to rear. In this manner I reared more than 100 larvæ at the first attempt, of which I gave many to Mr. Dorries and others, and yet bred 40 imagines myself. In 1906, Mr. Dorries received a number of eggs from Mr. Kalwe, and, following the same methods, reared more than 100 imagines. This year, again, Mr. Dorries has larvæ, but these have only just hatched, the eggs not being brought under the influence of warmth earlier, whilst my larvæ

are nearly fullfed (April 29th). I may add that we have observed that a few larvæ probably hatch in autumn, for we have both found eggs with holes that have the appearance of larvæ having quitted them; yet we have never found autumnal larvæ; probably 5 per cent. of the eggs thus found were empty.—AUGUST SELZER, Hamburg. May 11th, 1908. (Communicated by M. Gillmer.)

MORE FOODPLANTS FOR *TORTRIX PRONUBANA*.—In the *Entom. Record*, etc., vol. xix., p. 93, I recorded an instance of *Tortrix pronubana* spun up on the flower-stem of the common yellow toad-flax. This year I have bred two *T. pronubana* from strangely different plants, cyclamen and scarlet geranium. In both cases I found the larva feeding, and covered the pot in which the plants were growing with muslin, and awaited results. On May 6th, a fine female emerged from the pot of cyclamen, and, on May 31st, a female from the scarlet geranium. I know now that I have often found the larvæ and also empty pupa-cases on a bed of geraniums, but not ordinarily paying attention to Tortricids, I have not bred the insect from this plant before.—(REV.) FRANK E. LOWE, M.A., F.E.S., Guernsey. June 2nd, 1908.

NOTE ON THE LARVA OF *NOLA CRISTULALIS*.—On July 3rd, 1908, some larvæ of *Nola cristulalis*, about half-grown, were sent me by Mr. Crocker, collected just previously in the Chatham district. They were at the time feeding on oak. The larvæ are pale whitish-green, with a narrow dark green mediodorsal stripe, and remarkably long hairs arising from the dorsal warts; the head is pale, and the prolegs prominent, especially the anal pair. In the next instar they change to a brownish hue, especially on the thoracic area, the dorsal line being also reddish towards the anal end, the 8th abdominal segment also being brown dorsally; in this skin the larvæ are very like those in the last, but browner; the hairs, too, are darker. In the last skin the larvæ are of a yellowish ground-colour, the red-brown tubercles quite masking it however, and making the larva appear red-brown; the fine mediodorsal line in some parts densely black, the black extending transversely along the frontal part of the segmental incisions of the 1st, 2nd, and 3rd abdominal segments, especially the 1st and 3rd, and expanding into black chevrons on the dorsum of the 7th—9th abdominal segments. These are the more uniform red-brown examples. The pale form is yellow in ground colour, the dorsal warts also yellow, except those of the mesothorax, and the 1st, 2nd, and 7th abdominals, which are brownish; the supraspiracular line reddish, and the supraspiracular warts red-brown; the black marks are as in the preceding form, so that this paler form appears to be annulated with four darkish segments, *viz.*, the mesothorax, and the 1st, 2nd, and 7th abdominals, the black markings conspicuous on the pale colour. The method of walking of the larvæ is very peculiar, travelling at a very rapid pace, and partly looping, due to the fact that they have only three pairs of prolegs, the 3rd, as well as the 1st and 2nd, abdominal segments being without. It would appear, therefore, that the segments unprovided with prolegs are those that carry the dark markings. The great length of certain setæ on the thoracic and 8th and 9th abdominal segments are particularly noticeable, although all the apparently primitive setæ on the warts are especially long. Whilst feeding the larvæ apparently love to get between two leaves almost in contact, and eat away the soft cellular tissue on the

upper- or underside of the leaf on which they rest. Even the larger larvæ do not always eat through the whole thickness, and, when they do, it is only apparently by accidentally nibbling the epidermis, when they have finished the cellular tissue, and thus making little holes instead of the little round pale patches of skin which are left by the younger larvæ. They never seem to eat a leaf at its edges, and to the last the leaf gives the idea of being only slightly perforated. The larva clings tightly, and is not easily disturbed, but when thoroughly upset rolls in a ring and falls to the ground. One suspects that, in nature, this does not often occur as tending to take it from the neighbourhood of its food. By the middle of July the larvæ appear to be full-fed. Some under observation commenced to spin their cocoons from July 10th to 15th. Choosing the side of a little twig they spin a silken floor, and then gradually weave the sides of their little house, skilfully intertwining pieces of bark with the silk on the outer surface; then when the sides are done they arch over the roof, still using bark on the outside, and at last enclose themselves completely. The finished cocoon is of the typical Nolid form, like a boat turned upside down, the front part comparatively wide, the hinder part narrowly rounded off, and the whole appears so like a tiny excrescence of the oak-twig on which it is spun, that much skill would be required to detect it in nature. It would be a great addition to our knowledge if someone with leisure would observe step by step the making of this remarkable cocoon; which is very similar to those spun by the Hylophilids (*Earias chlorana*, etc.).—J. W. TUTT, 119, Westcombe Hill, S.E. July, 1908.

PLUSIA MONETA ON *ACONITUM LYCOCTONUM*.—A number of cocoons of *Plusia moneta* were discovered on the undersides of the leaves of *Aconitum lycoctonum* (the yellow monkshood) in my garden at Ilford. In the garden are also growing many plants of *A. napellus* and *A. napellus-bicolor*, but not a single leaf had any cocoons attached, and yet *A. napellus* is the old British species. Is the species restricted in other districts to *A. lycoctonum*? The imagines of *Plusia moneta* emerged from these cocoons between July 2nd and 9th.—J. H. S. HARRISON, 98, Thorold Road, Ilford, E. June 20th, 1908.

THE CHANGE IN COLOUR OF THE PUPA OF *ADKINIA GRAPHODACTYLA* VAR. *PNEUMONANTHES* BEFORE THE EMERGENCE OF THE IMAGO.—The fresh full-coloured pupa of *Adkinia* var. *pneumonanthès* has the green wings delicately marked with longitudinal lines of white, whilst the body, also green, has markedly pale longitudinal, lateral, and dorsal lines. The green areas of the wings and appendages then become pinkish, gradually darkening to brownish. Just before emergence, the pale lines of the body disappear, the thoracic and head areas become reddish, with the prominent parts transparent and glassy, the wings brownish, with paler neuration lines, the markings of the wings being clearly developed as the imago matures; the appendages are also dark; the body, however, remains green, with darker green rings just above each segmental incision, and dark longitudinal dashes above and below the spiracles. The cremastral area pinkish; a pale yellowish appearance then invades the abdominal area dorsally. The wings become finally almost black, with a quite velvety appearance, the spots on the abdomen darker, and the ground colour somewhat pinker.—J. W. TUTT. June, 1908.

COLEOPTERA.

RHYTIDOSOMUS GLOBULUS, HBST., AT DARENTH.—I beat a nice little series of this rare little weevil off aspens, at Darenth Wood, in June. This is a new locality for it. Commander Walker also took it this year for the first time in Oxfordshire. It is some twelve years since I took it last, on Wimbledon Common.—HORACE DONISTHORPE, F.E.S., 58, Kensington Mansions, S.W.

PHYMATODUS LIVIDUS AT READING.—I have to record that *Phymatodus lividus* has occurred here again this year (see *Ent. Rec.*, xviii., p. 294).—W. E. BUTLER, F.E.S., Hayling House, Oxford Road, Reading. July 6th, 1908.

HYMENOPTERA.

NOTOZUS PANZERI, F., IN SHERWOOD FOREST.—I swept a good number of this pretty little Chrysid in Sherwood Forest, in July. Mr. Morice tells me I should record it, as it has only been known to occur in the London and southern districts until now.—HORACE DONISTHORPE, F.E.S., 58, Kensington Mansions, S.W.

SIREX JUVENCUS AT CROUCH END.—I have much pleasure in recording the capture of a fine female specimen of *Sirex juvencus*. This magnificent insect was taken in my garden on August 8th, flying in the sunshine at three o'clock in the afternoon. It is a large specimen and measures three-and-a-quarter inches across the wings. Although taken in many parts of the country, it is, nevertheless, very rare.—J. A. CLARK, F.E.S., 57, Weston Park, Crouch End.

NOTES ON COLLECTING, Etc.

IMMIGRATION OF DRAGONFLIES INTO THE CHANNEL ISLANDS.—I am sending a few particulars of the "Dragon-flies' Invasion," reprinted in *Daily News* of July 10th, as I thought you might like to have a note for the *Ent. Record*. The note in *Daily News* is as follows:—

DRAGON FLIES' INVASION.—"Since Wednesday prodigious quantities of dragon-flies have traversed the island of Alderney and the adjacent mainland of France. At certain moments they formed dense clouds, flying low, or rising above the trees, while all proceeded in the same direction, from south-west to north-east. The phenomenon has created quite a sensation, and is looked upon by the inhabitants as an omen of great drought. Barges report being accompanied at sea by dragon-flies in immense numbers."

A French newspaper, *Eclair*, published at Cherbourg, has the following in its issue of Tuesday, July 7th.

"Since Saturday a prodigious quantity of dragon-flies, flying in the same direction (from S.W. to N.E.), have traversed the Nacqueville region. At certain moments of the day they formed immense clouds, either flying just above the land, or rising above the trees. This fact has appeared quite extraordinary throughout the country. It is thought to be a sign of great drought, the dragonflies emigrating to more humid localities than those from whence they came." (Translation.)

The following interesting letter was received from Alderney by a friend of mine on July 7th.

"You told me some time ago to let you know of anything out of the common. Well, this year I am particularly struck with the number of dragonflies here; they are not found in marshy places, but everywhere along the south of the island from east to west; they are in countless numbers; as they rise on your approach the air is quite alive with them. With our late lamented friend, Dr. Walker, I have caught them in Longy Road, but I have never seen more than a couple of dozen of them there. Dr. Walker told me he had caught this species

at Versailles, and other Continental places, and he was under the impression that those caught here were not indigenous to us. If this is the case, then it would certainly seem as if we had a flight of them from France during these long-prevailing easterly winds. I thought this might be of interest to you, and send you a few specimens. It is a lovely sight to watch them in the sun. I see them flying over my garden every minute, over Butes everywhere along the south. Every piece of dry furze is covered with them. Perhaps you can throw more light on it, but I am convinced they are not hatched here. The pond at Longy, the only place I have ever seen them, is dry."

The writer of the above letter was mistaken in this species of dragon-fly. Those captured by Dr. Walker in 1900 were *Sympetrum flavescens*. All the specimens sent with his letter were *Libellula quadrimaculata*, Linn.—W. A. LUFF, F.E.S., La Chaumière, Brock Road, Guernsey. July 14th, 1908.

CEMIOSTOMA LABURNELLA, ETC., AT LEWISHAM.—The fine weather of May and June is possibly responsible for the abundance of many species that are just now appearing. During the last four weeks many of the laburnum trees in the gardens hereabouts have had all the appearance of being scorched, owing to the mines of *Cemiostoma laburnella*, which, in some cases, occupy every leaf, yet the first brood was not at all specially noticeable. The first of the imagines have appeared to-day, dozens of the beautiful white atoms being on the fences under the trees. *Hyponomeuta cagnagellus* and *Hedya aceriana* are also in great abundance, the former beneath and on the *Euonymus japonicus* bushes, and the latter beneath the poplar trees.—A. M. COCHRANE, Lewisham. July 17th, 1908. [Many examples of what appears to be a third brood of *C. laburnella* were seen on the fences again on August 22nd and following days. Quite freshly-emerged examples of *H. cagnagellus* are also to be observed to date (August 28th).—A.M.C.]

HECATERA SERENA, ETC., ON BLACKHEATH.—It is always well to note the reappearance of species year by year in districts well within the London area. It is some years since I saw *Hecatera serena* in our immediate neighbourhood. Twenty-five years ago, a wild hawthorn hedge of about twelve to fifteen feet ran up either side of Westcombe Hill (then known as Combe Farm Lane), and, at the lower end, a long row of magnificent elms stood in the hedge; a row of poplars occurred higher up, with some ash and oak. On the elm-trunks one pretty regularly found *Hecatera serena*, but for some years an occasional one on a fence was the most that was noted, and of recent years the species has been missed altogether. This morning, whilst crossing Blackheath, a fine freshly-emerged example was noticed on one of the fences, whilst within a foot of it was an equally fine *Triaena psi* ab. *suffusa*. Three weeks ago (June 21st) a newly-emerged *Apatela aceris* was taken quite near the same spot. I noticed also, for the first time this year, *Hyponomeuta cagnagellus* in plenty on the fences, just newly-emerged. It would be interesting to know what really are the main factors in reducing and limiting our London fauna. I am forming an opinion that the "sparrow" has more to do with the matter than anything else, except, of course, building operations and their concomitant accessories—streets, etc. I saw, in Hither Green Lane (now no longer a lane), outside a baker's shop, on July 8th, an almost dead cockroach (*Blatta*) lying on its back. It had just a struggle in its legs, and was carried off by a sparrow within two yards of me, whilst three days previously, at Burnt Ash, I saw another pick up a large green

(apparently Noctuid) larva, and make off with it. The sparrows hunt under eaves in the most persistent way, and everything that moves by day is pounced on at once. On the other hand, species that maintain themselves best in London are those whose larvæ and imagines are both night-feeders, or otherwise night-flying species whose larvæ are internal feeders, or in other ways well-hidden. Ivy feeders (on walls near houses) are among the most abundant.—J. W. TUTT, 119, Westcombe Hill, S.E. *July 12th, 1908.*

VARIATION.

REMARKABLE ABERRATION OF *MELANIPPE SOCIATA*.—I have to record the capture of a strange aberration of *M. sociata* about a mile-and-a-half from Claygate, at about the centre of a triangle made by Claygate, Cobham, and Oxshott, at about 5 p.m. on June 8th, a very sunny day, in a small clearing in the middle of the pinewoods. It was on flight, and at first I thought it was a specimen of *Tanagra atrata*, but soon found that it was *Melanippe sociata*. The left half of the specimen, fore- and hindwings, is almost normal, except that the hindwing is rather blotchy; the right half brown-black, absolutely free from markings on both fore- and hindwings, although, in the former, the discoidal spot is seen distinctly, and the black of the hindwing shades off to a slightly lighter tint towards the base.—H. C. PHILLIPS, F.R.C.S.

AMPHIDASYS BETULARIA AB. DOUBLEDAYARIA AT BLACKHEATH.—It may be worth recording that, on June 3rd this year, I caught a pair of *Amphidasys betularia* ab. *doubledayaria*, in cop., on some palings at Blackheath; the female subsequently laid some eggs, which have since hatched.—STANLEY EDWARDS, F.Z.S., F.L.S., 15, St. German's Place, Blackheath. *July 22nd, 1908.*

CURRENT NOTES.

When our little book on *British Butterflies* was published in 1896, we unfortunately overlooked the life-history of the summer brood of *Cyaniris semiargus*, published some ten years earlier by Mr. Brabant of Cambrai (*Le Naturaliste*, 1886), but our attention was called to the omission directly our book had gone through press, by the further publication (*Bull. Soc. Ent. France*, 1896), of a short paper on the same subject by the same observer. During the last twelve months we have noted in our chapter on "Family Habits of Lycænid Larvæ" (*Nat. Hist. Brit. Lep.*, ix., p. 73), the fact that the larva hybernated in the 3rd larval instar, and further (p. 74) on the development of "forwards" among the summer larvæ, producing a more or less complete partial double-brood. In May this year Dr. Chapman exhibited at one of the South London Entomological Society's meetings, fullfed hibernating larvæ of this species that he had brought through the winter, and which had pupated in due course. Mr. Frohawk now (*Entom.*, July, 1908) gives an outline of this winter (larva-hibernating) brood, so that the general details of the two broods of the species are pretty well-known. Mr. Frohawk's remark that "hitherto the life-history of *L. acis* has remained a blank to British lepidopterists," must be taken *cum grano*, as most advanced British lepidopterists have certainly known for a long time the details published by Mr. Brabant 22 years ago. The fact remains that the British have been late in the field to rear this

species, but it has now been done simultaneously by two British lepidopterists.

Mr. Clemens Dziurzynski of Vienna has published a most useful descriptive catalogue of the "Palæarctic species of the genus *Zygæna*" (with one uncoloured, and two good coloured, plates) in the *Berl. Ent. Zeitschrift*, liii., pp. 1-60. He notes the modern usage of the name "*Anthrocera*," but retains "*Zygæna*" (the type of which is, according to Kirby, *phegea*, L., an Aretiid, and not an Anthrocerid, species). He follows generally the work in *The Natural History of British Lepidoptera*, vol. i., but here and there seems to be lacking in knowledge of magazine references (see p. 32, when he uses *tutti*, Reb., for *stephensi*, Dup., *Ent. Rec.*, xii., p. 352). He treats our British *Anthrocera hippocrepidis*, Stphs., (under the name of *tutti*) as a form of *A. filipendulæ*, with which it has nothing apparently in common, except the frequent occurrence of the six red spots on the forewing, and seems to have overlooked the fact that Bateson showed the ♂ genitalia to be practically identical with those of *A. trifolii*. The name *seriziata* is changed to *sericiata*, and the insect is treated as a distinct species from *palustris*, Bdv., without explanation. On the whole, however, the catalogue is a good and useful production, and all workers at the group will be thankful to Mr. Dziurzynski for it.

Mr. Stichel, too, gives (*op. cit.*) a most useful paper on some lepidoptera of the north of Europe. His references to literature seem pretty complete, but he has apparently overlooked the work done by Dr. Chapman in 1896 (*Ent. Rec.*, viii., pp. 289 *et seq.*). The students of *Pieris napi* will have to look up pp. 66-75, where the account is fairly extensive. The remarks concerning *Lycaena argyrognomon* var. *lapponica* also want careful attention. The notes (p. 91) on *Callophrys rubi* are hardly up-to-date (see *Nat. Hist. Brit. Lep.*, ix., pp. 91 *et seq.*).

In his continued notes "On the British species of *Phora*," Dr. Wood describes (*Ent. Mo. Mag.*) new species under the name of *rufa*, *dubitalis*, *emarginata*, *albicans*, *retroversa*, *fuscinervis*, *paludosa*, *spinigera*, and *campestris*.

Mr. Hamm gives (*Ent. Mo. Mag.*) an excellent account of the pairing habits, etc., of *Empis livida*, L., confirming the observation that the ♂ provides the ♀ with the prey on which she feeds during the period of copulation, and giving many other interesting details.

The form of *Anthrocera lavandulæ*, from North Algeria, named *nisseni* by the Hon. W. Rothschild (*Ent.*, p. 185), appears to be the same as that described by the Abbé J. de Joannis (*Bull. Soc. Ent. France*, p. 203), as *theryi*, from Philippeville. One suspects the latter name has precedence in publication.

An important paper "On the mouthparts of some *Blattidae*" by Joseph Mangan has just been published in the *Proceedings of the Royal Irish Academy*, vol. xviii., sect. B.

Mr. Luff sends us an interesting pamphlet on "The Non-British Insects of the Sarnian Islands." It contains interesting notes on all the non-British species of all orders occurring in these Islands.

(O)BITUARY.

Pierre Adrien Prosper Finot (*with photograph*). *See p. 193*
 Pierre Adrien Prosper Finot, Capitaine d'État Major en retraite,

Chevalier de la Légion d'Honneur, died at his residence at Fontainebleau on April 14th, 1908, at the age of 70.

A native of South Central France, Captain Finot graduated at l'École Polytechnique, and, afterwards, serving in the Franco-Prussian War, was taken prisoner at the disaster of Sedan. Upon his return from captivity in Germany, he found himself out of sympathy with the democratic institutions, and withdrew from further participation in public life. In a beautiful garden at Fontainebleau, shut off from the outside world by a high wall, within a few minutes' walk from the Château and Park which he loved so well, he built himself a house in which to spend the rest of his life.

His brother joined him, living in a separate building in the same garden, but, on his death some ten years later, his house was closed, only to be opened on one of those rare occasions when an entomological friend visited Captain Finot *en famille*. He lived a recluse for the rest of his days, seeing few people beyond his faithful servants and housekeeper, receiving few or no visitors, except his entomological friends from all lands, who were always welcomed with a most cordial hospitality. The writer of this notice, who mourns the loss of a good friend, spent many a happy day in his genial company, chatting of entomology and entomologists of all lands, for, although not a traveller, the extent of his reading gave him wide and broad-minded views on many subjects. His opinion, however, once formed, nothing could shake. To the very end he retained his faithful affection for his old Emperor and the imperial Régime. "I saw France happy under the Empire," he used to say, "and I know she would be happier were the Empire restored to-morrow." With Republicanism he had little sympathy, and even the most amiable and respected men in France he looked on with suspicion as "tools of the Freemasons," whom he regarded, like a true Roman Catholic, as the enemies of his Country and his Church. Yet it was characteristic of the man that he regularly read the newspapers of all parties; Royalist periodicals, and even those of Republican views, were always lying on his table. He followed the Dreyfus' case with a detached interest, as though from afar, but his military instincts made him look upon the unfortunate victim as really the guilty party.

Of a naturally studious and industrious disposition, Captain Finot was always occupied. An expert photographer, he filled many albums with views of the Château, its park, and of the forest which he loved so well. A clever carpenter, he made with his own hands many of the fittings of his entomological laboratory. Numerous pamphlets, which are a trouble to all scientific men, he bound himself. He was also an accomplished artist, and filled many portfolios with pencil sketches and water-colour views of the old towns and villages of France.

As an entomologist he was painstaking, even laborious. He compiled, for his own use, complete catalogues of the orthoptera, which are as remarkable for their caligraphy as for their thoroughness, and these he supplemented with manuscript of synoptical tables of all groups, partly copied from the standard works, partly compiled, and partly original. He collected little himself, especially in the later years of his life, but, by purchase and other means, he acquired a valuable and extensive collection of orthoptera.

In the literature of the subject, his name is chiefly associated with the Orthoptera-Fauna of his country and of Tunis and Algeria. His first important work was *Les Orthoptères de la France*, published in Paris in 1883, but this was followed some years later by a far more complete and comprehensive book, entitled *Faune de la France, Insectes Orthoptères: Thysanoures et Orthoptères proprement dits*, published by Deyrolle in 1890. This work is well known to British orthopterists, to whom it has been of great assistance, as all British species are included in the French fauna. It is admirably illustrated in a method quite characteristic of the author. He drew his insects ten times life size, and then reduced the drawings by photography to their natural size.

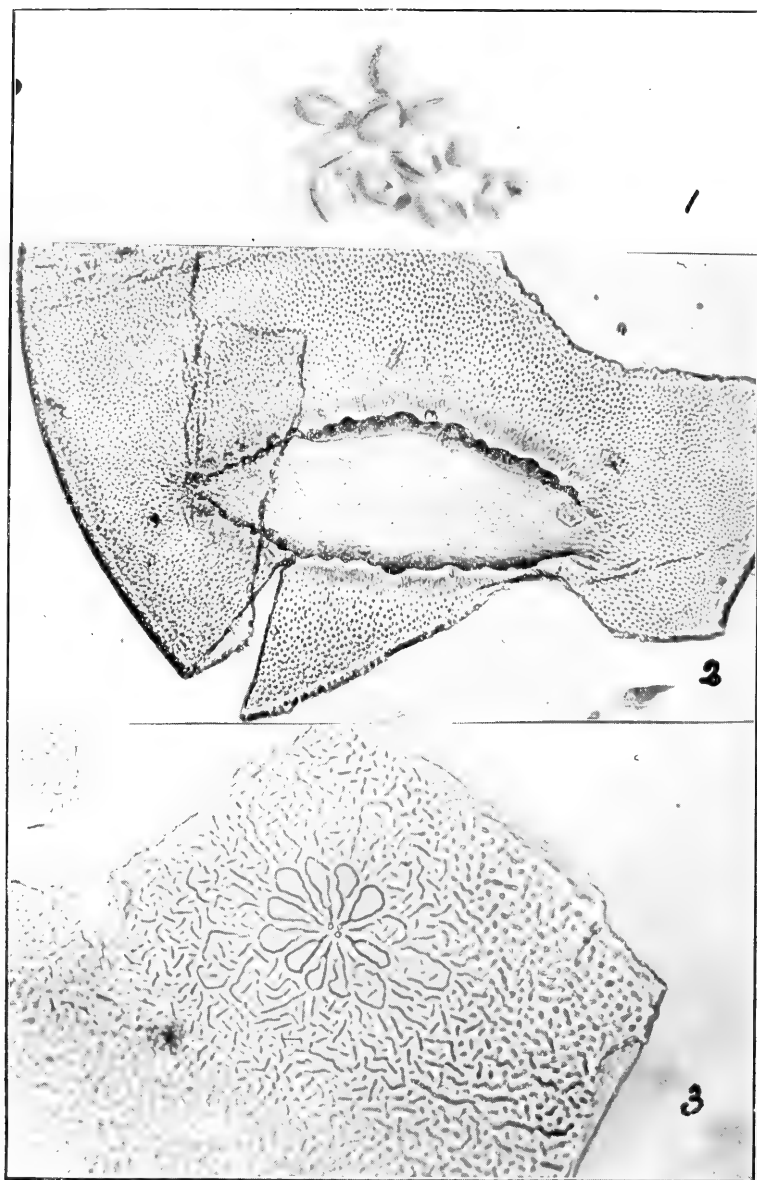
In 1885, there appeared the *Catalogue raisonné des Orthoptères de la Régence de Tunis*, written in collaboration with Edward Bonnet, published at Montpellier in 1885. This made no claim to be a monograph, but was merely an annotated catalogue of the Orthoptera of the Regency, which was the forerunner of a later and more comprehensive work entitled *Faune de l'Algérie et de la Tunisie—Insectes Orthoptères*, which appeared at intervals in the *Annales de la Société entomologique de France* during 1895 and 1896, finally published in book form by the Society in 1897. This is a very important work, and is indispensable to the student of our Palearctic Orthoptera. It is written on the same lines as the *Faune de la France*, and illustrated in the same way, though less extensively.

In addition to these books, Captain Finot produced several short papers dealing with new species of exotic orthoptera, including a revision of the genera *Euthymia* and *Acridium*. The latter appeared only a few months before the author's lamented death, and was reviewed in these papers in April (p. 81).

His home in Fontainebleau was admirably sheltered, for the town and forest are situated in a hollow, well protected from the winds, but in spite of the mildness of the climate, Captain Finot suffered nearly every winter from bronchial troubles and influenza. With the advent of milder weather he commenced those long tramps into the beautiful forest, which all who visited him remember so well. In spite of his years he tired out his guests. Father Navas, of Zaragoza, who visited him in 1905, wrote afterwards, "Gloriábase nuestro bravo militar, de que acompañado á otros excursionistas por la selva, siempre los habia fatigado. Á la verdad, no me rindió, pero tampoco le fatigué, y eso que cuenta ya sesenta y cinco años!"

In the latter years of his life he had suffered from poor health, which greatly hampered his work. During last summer, cerebral congestion prevented all studies for two or three months, and it was not until October that he was able to resume his work, which was again interrupted by a sharp attack of influenza, which confined him to his bed in January. Towards the end of March he wrote to the writer of this notice in a more hopeful strain, but that was the last word received from him.

In Captain Finot, France loses a fine patriot of the old school, many entomologists a valued friend, and the Science which we all love a devoted and painstaking worker.—M.B.



EGG OF ODEZIA ATRATA.

The Entomologist's Record, etc., 1908.

Lepidoptera of the Grisons—The Via Mala.

By J. W. TUTT, F.E.S.

The morning of August 23rd, 1907, presented a great contrast with the preceding day. The sun was hot, but everything was soaked with the heavy rain that had so persistently fallen. Hence a walk up the famed Via Mala towards the Splügen was not particularly promising. The beautiful gorge is so deep, its sides so steep, its path so winding, that the sun does not have a great chance to effect the sudden changes that sometimes occur in the Alps. At first, there was nothing on the wing except a few *Dryas paphia* and *Erebia aethiops*, but, after a while, these species became exceedingly abundant, together with var. *valezina*, but both species were far past their prime, although a small percentage of *E. aethiops* were still in passable condition. *Erebia goante*, the ♀s large and wide-banded, were, however, altogether *passé*, as also were *Melanargia galathea*, worn examples of both species being in great numbers, whilst *Erebia ligea* was in rags. On the rocks were some interesting species. Commonest, perhaps, were *Eubolia bipunctaria* and *Larentia caesiata*, although a ♀ *Lithosia quadra* and a single *L. cereola* or *unita* were rather unexpected, but several ♀s of *Lymantria monacha* sat placidly enough, and fell helplessly when disturbed, reminding one much of ♀ *Porthetria dispar* often found in similar situations among the mountains of Savoy and Piedmont; these, however, were of both sexes, and the ♂s showed no special signs of activity. Among a host of *Erebia goante*, *E. aethiops*, and *Epinephela ianira*, a very striking specimen suddenly flitted from one flower to another displaying large pallid patches in the right wings. It was at once netted and proved to be an exceedingly fine albescent form of *E. ianira* evidently just emerged from pupa = ab. *dextro-albescens*. I also captured two ♂s of *Erebia aethiops*, the right hindwing in each case being absent, except so far as a small unexpanded sacculus occupied the normal position of the base. *Urbicula comma* was very abundant, some of the ♂s with the underside spots of a quite flavescent hue, whilst an occasional *Hesperia alveus* was also noticed. As the morning advanced, *Argynnis adippe* became abundant with *Dryas paphia*, the examples with strikingly rich fulvous undersides, but *Parnassius apollo*, though frequent, could not by any means be called abundant. One of the commonest butterflies of the valley was *Polyommatus icarus*, a newly-emerged brood of which had evidently just appeared and swarmed at the puddles in the road, all ♂s, however, no ♀ being observed even on the banks, whilst very few of the examples, too, were of the form *icarinus*. Almost as common was *Agriades corydon*, in both sexes, and a few ♂ *A. bellargus* foreshadowed a brood of this species, which was evidently just emerging, but these were more abundant on the flower-banks just beyond the Via Mala, where, also, a few worn *Cyaniris semiargus* ♂s were taken, and a single *Polyommatus eros*. Here, too, a single *Lycaena arion* was observed flying rapidly up the slopes, and was soon lost to sight. *Dryas paphia* was again in great numbers, the imagines sitting and sunning themselves on the flower-heads of a large Umbellifer that grew by the sides of the fields; whilst some freshly-emerged *Vanessa io* also consorted with them. The latter species, however, was evidently not fully out, for a large number of larvæ of this species and *Aglais urticae* were found widely spread over the nettle-beds by the

OCTOBER 15TH, 1908.

roadside, both species nearly fullfed, and spinning up within a day or two of capture. Here, too, on the cats'-mint flowers were two freshly-emerged *Loweia dorilis*, the forerunners no doubt of an autumn brood, whilst the disturbance of some hedge *Stachys* caused a fine freshly-emerged *Amblyptilia acanthodactyla* (*punctidactyla*) to discover itself, though further search failed to disturb another. A walk along the road towards Splügen discovered nothing further, except a few *Colias hyale*, freshly-emerged on the slopes, and *Coenonympha pamphilus* in the fields, and, on a flowery bank, *Acidalia perochraria*. A beautiful specimen of *Argynnis adippe* was netted among the many other insects that underwent inspection. It was markedly of the *cleodora* type (often erroneously stated not to be taken north of the main chain of the Alps, in Switzerland), but the ground colour of the wings was of a deep fulvous tint, the transverse band in which the single row of small silver spots is set particularly so, whilst the spots that replace the other silver ones are of much darker yellow ochreous than is usual=ab. *cleodora-fulvescens*, n. ab., whilst yet another has the innermost large square black dot near the centre of the underside of the forewings extended into a large wedge-shaped spot the apex pointing towards the base of the wing=ab. *cuneata*, n. ab. No doubt, a little earlier in the season, a careful sorting of the specimens of this species in this district would produce a very satisfactory result. On the way back, a large ♀ *Lasiocampa quercus* was taken from the rock, but, with the exception of a few *Micros*, no other species seems to have been observed.

The next morning was occupied with a walk from Thusis to the entrance of the Albula Valley, through the village of Sils. Most of the species observed in the Via Mala were on the wing, *Dryas paphia* being seen in numbers and var. *ralesina* occasionally, whilst *Limenitis camilla*, fine bright coppery ♀ *Loweia dorilis*, the ♂ s worn, an abundance of *Enodia hyperanthus* ab. *caeca*, but very worn, and a single *Enodia dryas* may also be mentioned. We observed a butterfly drop suddenly on a clover-head, and, netting it, found it to be a ♀ *Bithys quercus*, an unusual habit for this species, in our experience. *Plebeius argus* (*argyrogonomon*), *Aricia astrarche*, *Polyommatus icarus*, and *Agriades corydon* were the only blues observed.

From Thusis we came straight home *via* Zürich and Basle; the collecting for the season was now actually over, and there are now only the specimens and the memories of the summer holiday of 1907.

Notes from the Pyrenees—*Odezia atrata* and its Variation (with plates).

By T. A. CHAPMAN, M.D.

Somewhere near the Col de Riou, between Luz and Caunterets, I took, on August 5th, 1907, a ♀ of *Odezia atrata*, which happened to be a marked example of the var. *pyrenaica*, which is apparently identical with the Italian var. *costai*, Calb. She provided me with a good supply of ova, which enabled me to study the species and the relation to it of this variety. I gather from Rondou's *Catalogue* that he has not met with this variety in the central Pyrenees, as he quotes Pyrénées Orientales, with a reference to the original record of Graslín, but notes the type form as being of general distribution up to a considerable elevation.

From these eggs I bred some five or six dozen moths. The early stages presented some points of interest. As a matter of fact *O. atrata* being one of our common moths, no one seems to have thought it worth while to note its early stages, and nothing much is, I think, recorded about it in our language. There is Buckler's account of the larva, which stands out almost alone, unless we refer to Mr. Tutt's account of the egg (*Ent. Rec.*, vol. xv., p. 338), which shows meagreness, due to the use of a hand-lens in the examination. There is, however, also a very curious oversight, *viz.*, the remarkable sulci, of which the egg possesses one on each side, are described as "a deep longitudinal depression running up the whole length of one side of the egg, making it exactly like a grain of wheat in shape." That there was a sulcus on each side appears to have escaped observation. The egg is, therefore, only half like a grain of wheat, whichever side you look at is like the grooved face of the wheat, neither side is like the rounded back of the grain, though the larger side of the egg is not unlike it, the resemblance in appearance to a grain of wheat may therefore stand, but there is no complete resemblance in form (*see* pl. xix., fig. 1).

The imagines reared at Reigate present several females as well marked as their parent, and several males not, at first glance, very different from English specimens of *O. atrata*, the majority approach *pyrenaica* more nearly than typical *atrata*. The largest of the bred males is about 34mm. in expanse, and the group averages altogether larger than English *atrata*, which Meyrick notes as 24mm. to 26mm. (an inch). Swiss specimens I have are even larger than the Pyrenean (bred) examples. The var. *pyrenaica* is characterised by an abundant sprinkling of brownish-yellow scales, giving it a paler and speckled appearance—they are so prominent a feature that they at once attract attention. None of my bred specimens were more densely clothed with yellow scales than their mother, and some were very much less so. Whether this is the normal state of matters in the wild state, or whether the loss of yellow scales was due to breeding in England in captivity I cannot say. No specimens were without yellow scales. One feature that I have never noticed in English specimens, and is most marked in the Pyrenean ones with a medium supply of yellow dotting, less so in the others, is that the upper wings are more plentifully sprinkled than the hind ones, and the effect is to deprive the insect of the appearance of all the wings being of the same colour and texture (as usual in butterflies, and some other day-flying insects), and to give the definite appearance of upper- and underwings, so usual in Noctuids and many Geometrids.

I have already called attention to the variability in my series of the amount of yellow scaling, and this brings me to a point that has astonished me. This is, that in Swiss and English *O. atrata*, a majority of specimens present a fair sprinkling of yellow scales, and yet in no description of the insect I have referred to is it described as otherwise than (except the apical white line) absolutely and completely black. It is true that these non-Pyrenean examples look black even on close observation, but here and there one may be seen with the yellow scales visible to a slight scrutiny, and in very few are they seen to be quite absent, when examined with a hand lens. Still, only a few exceed, if they do exceed, the one or two Pyrenean specimens that are the blackest and most free from coloured scales. In this

respect the series certainly meet if they do not overlap. This frequency of yellow scales in ordinary *O. atrata* makes the absolute silence of authors about them somewhat remarkable. It would appear therefore that var. *pyrenaica* is not in any way a discontinuous form of the species, but merely presents an extreme amount of a coloration that is usual in the ordinary race. It is also the case, if my experience is at all typical, that *pyrenaica* as a variety, that is as a local race, varies from nearly the normal type to an extreme sprinkling of yellow, the latter being in fact rather an aberration than a variety, *i.e.*, a race. I have already noted the possibility that my specimens have varied towards the type owing to their changed environment. This may be so, I do not know of any records of more than a few specimens of either *pyrenaica* or *costai*. I find no reference to it in Oberthür's *Etudes*.

The egg is a most specialised structure, and unlike any other egg I happen to know. It is egg-shaped, like most Geometrid eggs, flattened at the micropylar end, 0.7mm. long and 0.46mm. wide. It has, however, two remarkable sulci, one on each side, running not quite from end to end, but some 0.5mm. long. These sulci, though on opposite sides, are not exactly opposite each other, but rather nearer one margin, so that, in cross-section, the outline would be not unlike that of a "cottage loaf," with a larger portion on one side than the other, something like that shown on diagram (2). The same fact may be noticed



DIAGRAM OF EGG OF ODEZIA ATRATA.

in Mr. Tonge's photograph of the eggs (pl. xix., fig. 1), where one or two eggs at the right hand of the group are seen end on. The sulci are portions of the egg-surface depressed to a lower level, with rather thick edges of darker texture, whose margins are sharp and crenulated. The structure is well shown in the photograph, pl. xix., fig. 2, by Mr. Clark ($\times 140$). The bottom of the sulcus (here flattened out) has much less sculpture than the egg-surface, it is, indeed, difficult to see that it has any. The general surface is covered with fine dots, which are arranged in hexagons. Under a low power the hexagons are more visible than the dots, which are well shown in both Mr. Clark's photographs. The micropyle has a rosette of about twelve cells; it is well demonstrated in pl. xix., fig. 3 ($\times 350$). The hexagons seen under a low power are hollows, to which the dots more or less conform, but do not, strictly speaking, outline.

There can be little doubt that the egg is subject to great variations of moisture during its prolonged and exposed existence. It seemed therefore probable that the furrows enabled the egg to expand and

contract according to the absorption of water, or loss by evaporation. I still think this may be so, but I found that some eggs left for some days in water, compared with others kept very dry, showed no appreciable difference either in the size or the width of the sulcus. A question as to freezing and consequent expansion may also be an explanation. My observations did not clearly demonstrate, but they suggested that the sulci did afford the means of expansion and contraction, but not by widening or closing, but simply by acting as hinges, enabling the shell on either side of them to curl or uncurl as greater or less space in the egg was required. The eggs are laid quite loosely, and must naturally fall to, and lie on, the ground, and there they must rest (in England) from June till the end of March, and on the higher slopes of the Pyrenees, where I met with var. *pyrenaica*, from August till May. I believe there is no evidence of a second-brood, certainly no egg hatched, either of my Pyrenean eggs or of English eggs laid in June. The larva does not develop within the egg till the spring. My eggs hatched just as leaves of *Bunium flexuosum* could be found appearing, and my moths emerged before the plant was well in flower, they were therefore rather earlier than they probably are naturally, as the full-fed larvæ are reputed to live in the flowers (Buckler).

I entertain no doubt that the peculiar structure of the egg has some relation to the long period, some eight or nine months, during which the egg has to take its chance lying on the ground, but what that may be I cannot say beyond what I have already noted. The egg-shell is very thick and hard for so small an egg, as I had reason to discover when cutting it up to place portions on slides for examination. This is, of course, useful against mechanical and meteorological vicissitudes, and may explain why my experiment of soaking and drying them for a week produced so little result. This very hardness and density would, however, make it all the more necessary for some special provision, such as the sulci appear to be, to exist to meet variations in bulk of a hygrometric character.

The eggs are greenish when first laid, and after a time become pale ochreous. I brought my eggs from their winter-quarters on March 15th, 1908; most were nearly of the pale luteous tint they were in autumn, but a few were quite dark, these were those in which the larvæ were ready for hatching, and as they matured the other eggs assumed in turn the same dark colour, the change occupying something like a week to take place; none were hatched when I brought them in on the 15th, but on the 16th several hatched; whether these would have hatched earlier had I brought them into the warmer room a day or two earlier, or could have remained unhatched a day or two longer in the cool, I do not know, but do not think after once the larva is developed that they have more than a day or two's discretion. A few hatched daily, then I note on March 23rd eight hatched, and the remaining eggs are some dark and some unchanged in colour. The further hatchings were—24th, 7; 25th, 5; 26th, 8; 27th, 5; 28th, 7; 29th, 4.

(To be concluded.)

A further note on the Egglaying of *Brenthis amathusia* with some remarks on the hybernating stage of the Argynnid and Brenthid groups of fritillaries.

By J. W. TUTT, F.E.S.

In the June number of this magazine (*anteà* p. 139) Mr. Gillmer published some interesting notes on the egglaying and young larva of *Brenthis amathusia*. This is a beautiful fritillary, usually considerably larger than our *B. euphrosyne*, to which it is somewhat closely allied. Its underside, however, is very like that of *B. dia*. It happened to be my good fortune on the morning of August 3rd, 1908, to observe, in the Dischma-Thal, in the Canton Grisons, a ♀ *B. amathusia* carefully inspecting the leaves of a violet plant that grew among a number of other wild plants at the foot of a stone-wall some little distance up the valley.

The examination appeared to prove quite satisfactory, for she rested a moment, and I rather expected to see her deposit an egg there. However, she did not do so but flew up the wall for a distance of about four or six inches, above the tops of the plants, rested at once on a little moss plant growing on the wall, and, almost without hesitation, attached very carefully a pale pinkish egg to the underside of a short stem of the moss, leaving it and resting again to place, as I supposed, another about three inches off, before I netted her.

I found the first egg without much trouble, but failed to find the second, if one indeed was laid. I picked off the piece of moss and put it in a small box. The egg soon became glassy-looking, and the embryo was to be observed curled up inside. On September 6th I looked at the egg, but the larva had not then appeared, but, on September 10th I found the egg empty and the young larva actively crawling over the moss. Having nothing on which I could possibly tempt it to feed, I forwarded it on the 11th to Dr. Chapman.

This observation suggests considerable difference in the egg-laying habit as observed on this occasion and by Mr. Gillmer in Germany. One suspects, however, from the context (*anteà* p. 138) that the eggs obtained by Mr. Gillmer were laid in confinement, in which case the fact that they were laid on dry stalks and leaves, and on the ground itself, is not unlike the habit here noticed. The much longer period of remaining in the egg is noticeable.

It is well known that *Argynnis adippe* and *A. elisa*, whose larvæ pass the winter alive in the egg-shell, without hatching, and *A. aglaia* and *Dryas paphia* whose larvæ leave the egg-shell in August and immediately hibernate, preferably choose a position near, but not on, the food-plant, and the closely allied N. American species, that appear to have identical habits, do the same. The reason is obvious in the case of egg-hibernating species, for the violet-leaves would decay in winter and danger to the egg occur, and in the case of the others possibly some such danger in the egg-stage has led to the autumn-hatching followed by immediate hibernation.

But it is quite new for us to have (as Mr. Gillmer avers) a Brenthid larva hibernating straight from the egg. Larvæ of *Brenthis selene*, *B. euphrosyne*, *B. dia*, *B. thore*, etc., hibernate in the fourth instar, and further enquiry into the hibernating stage of the Brenthid section of the fritillaries is very desirable. One would suppose that *Brenthis*

daphne, *B. ino*, etc., are nearer the true Argynnis than any of those already mentioned, and we would like to know exactly what their hibernating habits are, and whether they follow (or not) the hibernating habit of most of the Brenthids, of passing the winter in the fourth larval instar. We have already dealt with the matter in *The Nat. Hist. of British Butterflies*, ii., pp. 2-3, 7-9, 28-31, but more information on the subject is very desirable.

Lepidopterological Notes from the Hailsham district—The Aurora Borealis and treacle.

By RUSSELL E. JAMES.

On Wednesday, July 1st, the night of the "Aurora Borealis," or whatever it might be, I was treacling in the woods at Hailsham. Both on this and the preceding nights moths swarmed on the trees, as they used to do in the early "nineties."

The light at Hailsham on June 30th was quite normal, but, on July 1st, at nine o'clock, it was still full daylight, and, at 10 p.m. was little more than early dusk. It was most interesting to find that the light made no difference whatever to the moths in their times of flight. Early Geometrids commenced flying along the hedgerows at the same time as usual, and were joined by roving Noctuids about 8.45 p.m., as on the previous evening. A fine *Bisulcia ligustri* and other Noctuids were picked off privet blossoms at nine o'clock in broad daylight, and by 9.10 p.m. moths were thick on the treacled trees. At one point of my round the treacle patches were fully exposed to the glare, and yet the moths fed greedily and quite unabashed by the abnormal conditions. Their behaviour was perfectly normal, and they were neither more nor less skittish than usual. A lamp was superfluous, and I continued to box without its aid up till 10 p.m., even in the darkest parts of the wood.

The species on treacle were mostly common ones, but a few better things were to be picked out among them—notably a fine *Triphaena subsequa*. *B. ligustri* was not uncommon, but *Aplecta herbida* was over, only a few worn specimens occurring. *Xylophasia hepatica* also was going over, though still common, and, on the second evening, *Hyphenodes albistrigalis* was coming on well. Three *Cleoceris viminalis* occurred on the last round of the second night, keeping up its reputation for being a late comer, and on the same round I took a hibernated *Scoliopteryx libatrix*—the latest date I have ever seen it. The great bulk of specimens were of the genus *Noctua*—*triangulum*, *brunnea*, and *festiva*, the immense numbers and fine condition of the two latter species tempting me to pick out a number for renewal purposes. *Cymatophora duplaris* was also exceedingly common, and many were still in fine condition, but there was no sign either of *C. or* or *C. fluctuosa*. *Thyatira batis* and *Gonophora derasa* both occurred, of course, and several of the ubiquitous *Phlogophora meticulosa*. I have taken this species every month of the year excepting December and January. *Erastria fuscula* was still common, and an unusual sugar visitor was *Hyphenia proboscidalis*. *Zanclognatha tarsipennalis* and *Z. grisealis* swarmed, and in all 44 species of Noctuids occurred on the two nights, besides a quite remarkable number of Geometrids and Tortricids.

I did no day work in the woods on this visit, as I was scouring the country on a bicycle in search of *Acidalia immorata*, which species I eventually discovered in rather small numbers. I think it quite possible that my locality may be a fresh one and not the recognised one (which I do not know), as I took them whilst trespassing on some private ground of sufficiently alluring aspect to tempt me inside. *Argynnis adippe* and belated *Brenthis selene* occurred on the same spot. A run over the Cliffe Hill at Lewes was spoiled by the high wind. *Rhagades globulariae* was either blown away or over, as I could not find it, but a couple of *Adscita geryon* were taken at rest on birds'-foot trefoil. *Agrotis corticea* was seen flying naturally in the sun to wild thyme blossom, and a few *Merrifieldia tridactyla* (*tetradactyla*) were kicked up. On a fence under some clematis *Eupithecia isogrammata* and *Phibalapteryx tersata* were at rest, and others were beaten out. I only, however, spent a very little time here. At dusk, in the Hailsham woods, nothing of great interest occurred. *Cymatophora duplaris* was common along the hedgerows, and *Angerona prunaria* in the glades. *Timandra amataria* was not uncommon, and single *Acidalia imitaria*, *Cidaria picata*, and *Aphomia sociella* were netted.

I had little chance, however, of giving attention to dusking, as, after two long days' exploring, I was pressed for time in the evening, and when the treacle was on it was almost time to commence working it.

For the first time, on this two days' trip, I used Newman's relaxing-tins. Excellent as these are in many respects, I would offer a word of warning as to insects taken at treacle. Perhaps I left them too long, or packed too tightly, but, when emptied out seven days later, a fair number of Noctuids were soaked through in exuded treacle and hopelessly spoiled. All other captures were in fine order, so in future I shall endeavour to set all my treacle captures and only pack others.

The Egg-laying of *Leptidia sinapis*.

By J. W. TUTT, F.E.S.

On the morning of July 30th, 1908, above Staefa, I watched a ♀ *L. sinapis* laying her eggs. She flew very steadily and slowly through the low plants on a bankside, examining with her antennæ anything at all likely for her purpose, but backing steadily when not suitable, and carefully threading her way till the vetchling she was seeking was found. She examined the plant most carefully, and having found it to her liking clung to the stem just below one of the little double leaflets, hanging vertically, and extending her slender abdomen as far as possible from the stem, the wings meanwhile drawn up closely together, then, after a moment, slightly bending her abdomen to one side she curled it beneath and raised it gradually until it formed a curve, the apex of the abdomen stretching upwards, first level with the legs, then beyond, until it was pressed against the underside of one of the leaflets, which was the point of attack. Having reached it, the front of the abdomen was slowly moved to and fro until the right spot was found, when the pale yellowish egg was deposited and the abdomen lowered, and the ♀ almost directly commenced her flight. She seemed studiously to neglect all the little plants on which aphides were to be found. One ♀ examined care-

fully at least a dozen such plants with her antennæ, and seemed hard pressed in the wish to lay, once or twice coiling her abdomen as if about to do so, but finally leaving the plant to find one not aphid-tenanted. The female seems only to lay one egg on a plant, but a suitable plant may be found to have two or three eggs on it, each egg evidently laid by different ♀s. In 24 hours the pale-coloured egg has become yellow, but does not change to its bright orange tint until some three or four days at least have passed. The slow methodical manner in which a ♀, when egg-laying, threads its way through the herbage, leaves no manner of doubt as to her intention. At other times, when feeding, she flies higher and somewhat more rapidly, selecting the flowers from which she chooses to suck the nectar, and resting some time when thus engaged. A ♀ was observed to leave her egg-laying to visit some thyme-flowers, but she was very restless, stayed only a few moments and returned to the business on hand. It is, perhaps, worthy of note that the ♀s were more puzzled by a slender-leaved *Euphorbia* than any other plant, and seemed sometimes to hover over it with considerable uncertainty.

Coleoptera, etc., in the Isle of Wight.

By H. St. J. K. DONISTHORPE, F.Z.S., F.E.S.

I took a house at Sandown for four weeks from the 1st of August last, and the following are some of my entomological captures during that time. During the first three weeks the drought made insects scarce, and when the rain did come, we had too much of it. Still, on the whole, I did fairly well and added some very interesting species to the Isle of Wight coleopterous fauna. Those species marked with * are new to the Island's list. At Sandown the following species may be mentioned:—*Abdera bifasciata*, swept off umbels; * *Monotoma longicollis*, in vegetable refuse; *Throscus obtusus*, not uncommon by beating a dead hedge; * *Phyllodecta cavifrons*, abundant on white poplar; *Apthona nigriceps*, sweeping in a copse, this is a remarkable record as it is only recorded from Eggington near Burton-on-Trent, Cowfold, and Kircaldy in Scotland. Its food-plant is *Geranium pratense* (crane's bill); * *Lathridius angulatus*, at roots of *Lotus major*, etc. I took a specimen of this species in cop. with *Corticaria crenulata*. * *Habrocerus capillaricornis*, sweeping; *Apion varipes*, sweeping red clover, not very common; *Apion dissimile*, common on "hare's foot" trefoil; *Apion filirostre* on *Medicago sativa*; *Caulotrypis aeneopiceus*, common beating dead hedge; *Mordellistena parvula*, sweeping at Culver (I swept it at Niton in July); *Salpingus ater*, on white posts in the evening; *Limnichus pygmaeus*, in wet moss; *Homalota divisa*, in dead crab; * *Homalota inquinula*, in dung; * *Homalota indubia*, under refuse; * *Homalota boletobia*, sweeping; *Sitones cambricus*, in great profusion at roots of *Lotus major*; * *Sunius lyonessius*, Joy, I took two specimens of this insect, which has just been described by my friend Dr. Joy (see *F.M.M.*, 1908, p. 177), as a subspecies, one under a board, and the other by beating a dead hedge. He now thinks, and I quite agree with him, that it is a good and distinct species. *Anisoxya fuscula* beating dead hedge, this is only the second specimen recorded from the island, the first was taken by me at Freshwater, some years ago; *Acupalpus flavicollis* at roots of rushes, * *Ochthebius exaratus*, this very

small and rare species was abundant in a small pool on the cliffs, Fowler only records it from Gravesend, Whitstable, Southend, Rainham and Lewes; **Helophorus 4-signatus* in the same pool in company with *Ochthebius punctatus* and *marinus*; **Codiosoma spadix* not uncommon in the "break-waters"; *Orthochaetes setiger*, at roots of plants; **Ceuthorhynchus triangulum* at roots of *Achillea millefolium*, this rare species is easily distinguished from *campestris* by its long thorax; *Cathomiocerus socius* at roots of *Sonchus* (sow-thistle). I also took it at Whitecliff Bay in the same way, it is evidently associated with this plant, as Champion recorded most of his specimens in the same way. **Stenus latifrons*, sweeping in a marsh, **Coeliodes cardui* at roots of plants. At Bembridge *Anisodactylus poeciloides* was in the utmost profusion under stones on a salt marsh; **Anisodactylus binotatus* and its var. **spurcaticonis* occurred, but much more sparingly; *Harpalus parallelus*, *Taphria nivale*, *Stomis pumicatus*, *Dichirotrichus obsoletus* and *Silpha tristis* occurred under the same stones. Under sea-weed I took a specimen of **Trogolinus anglicanus*, this is a capture of extreme interest and importance, the species having only been found at Plymouth before in Britain, where it was discovered by Mr. Keys (I took a second specimen on the sea-wall at St. Helens, when in company with Professor Poulton). It is said to occur in New Zealand, my captures disprove of any idea of its having been introduced into Plymouth from there. A nice series of the var. *binotatum* of *Cercyon litoralis* was obtained. I also took it at Whitecliff Bay, under seaweed; *Bembidium affine* occurred under stones, and *Bledius bicornis* and **Anthicus tristis* var. *schaumi* on the mud-flat. At Ventnor *Homalota pavens*, *Trogophloeus bilineatus*, *Quedius umbrinus*, *Mylaena brevicornis* occurred in moss in the waterfall, in company with *Elmis subviolaceus* and *Dianous coerulescens*. At Luccombe Chine *Actobius villosulus*, *Heterocerus fuscus*, *Bembidium concinnum*, etc., occurred on mud, and *Sitones waterhousei*, not uncommon at roots of *Lotus corniculatus* (I also found this at Whitecliff Bay); at Blackgang Chine the tiger-beetle, *Cicindela germanica* was as abundant as ever, *Bembidium anglicanum* common under stones; *Sibinia arenariae* in profusion at roots of *Arenaria maritima*, *Opatrum sabulosum* in less numbers, and **Hypera murina*. Near Freshwater I took an **Aleochara cuniculorum*, in a rabbit-burrow, it was a very small specimen and I sent it abroad for confirmation. I also took an *Oxyptoda* beating the dead hedge at Sandown, which I believe is new, and appears to me to agree with *confusa*: I have sent this abroad also.

In the *Orthoptera* the small *Tettix*, which was very abundant at Luccombe Chine, was coloured exactly to resemble the moss and lichen on the ground where it occurred, and was invisible until it jumped. *Forficula lesnei* was common at Sandown, Blackgang, etc., and the small "earwig," *Labia minor*, occurred in a hot-bed in my garden in company with *Lithocharis ochracea*, the resemblance between the two insects (as has been pointed out before by Mr. Keys) being very marked.

I dug up a lepidopterous pupa on the cliffs at Sandown, which I gave to Mr. Taylor, and he tells me it has hatched and is *Hepialus sylvinus*. I may mention that Mr. J. Taylor has taken the "Blister Beetle," *Lytta vesicatoria*, at Sandown, and also **Philonthus corruscus*,

and he showed me a fine specimen of **Hylotrupes bajulus* he took in his window a few years ago.

I bred specimens of the fly *Phyto melanocephala*, Mg., from woodlice taken under stones at Bembridge. The pupa of the fly filled up the inside of the wood-louse. Mr. Austin tells me this is of great interest, as the life-history of this fly is quite unknown, though the larva of a nearly-related species, *Rhinophora atramentaria*, Mg., has been recorded in *Oniscus asellus*.

A few bugs I took may be worthy of mention, *Coreus denticulata*, Scop., *Miridius quadrivirgatus*, Costa, *Piezodosus incarnatus*, Gem., and *Metacanthus punctipes*, were swept at Sandown, and *Allia acuminata*, L., at Bembridge. The most interesting captures, however, were specimens of *Orthotylus rubidus*, Put., larvæ and perfect insects being taken on a mud flat at Bembridge. They jumped upon young shoots of *Salicornia herbacea* ("Marsh Samphire") and *Suaeda maritima*, and, as their colour is exactly of the same shade of pink as the plants, they become, of course, invisible.

In Hymenoptera, *Formica rufibarbis* var. *fusco-rufibarbis* is common at Sandown, etc. I took a number of the little ant *Solenopsis fugax* at Blackgang, all at roots of *Arenaria maritima*, some with *Lasius flavus* and *L. niger*, and some alone. *Mutilla rufipes*, ♂, was taken at Luccombe, and ♀s at Blackgang. A fine ♀ of *Methoca ichneumonoides* was captured crawling on the mud in Blackgang Chine. The Fossor, *Mellinus arvensis*, was captured at Blackgang and Whitecliff Bay; in each case with a Dipteron, its prey, in its clutches. I saw it catch and paralyse instantly, the fly at Blackgang.

Everes alcetas (coretas) as a distinct species from Everes argiades.

By J. W. TUTT, F.E.S.

In the April number of this magazine (*anteà* pp. 79 *et seq.*) I discussed the question of *Everes argiades* and *E. alcetas*, from the point of view that they were forms of the same species. I particularly brought forward all the points in favour of considering them the same, and left out the facts that told in the opposite direction. By taking this view (opposite to that which had recently been expressed by various entomologists—Jachontov, Brown, Oberthür, etc.) I hoped to get (1) answers to the difficulties I set up in the acceptance of them as separate species, (2) more definite knowledge of the structure of the two forms, particularly as to whether the details of their ancillary structure presented any good characters of differentiation. I have unfortunately not been able to draw an answer to the points raised in the first query, and there still remain the especial difficulties created (1) by the record of *alcetas* (*coretas*) as a mere aberration, occurring very rarely with the type form in certain parts of Russia, Germany, Lower Austria, Hungary, etc.; (2) the absence of any direct information showing that in Russia, Germany, Austria, etc., where both insects occur, there is any differentiation in the life-cycles, habits, habitats, etc. In fact, the general statements available incline, indeed, in the opposite direction, and this information, still most important and desirable, can only be obtained by lepidopterists on the spot. In Switzerland and in France we appear to have got the matter fairly well in hand, and have evidence to show that the forms are differen-

tiated in habitat, occupying their own grounds, which may be, and often are, comparatively near to each other; but, of the differentiation of the life-cycle and life-habits, we at present know absolutely nothing.

Of the other question raised we have much more information. We noted (*antè* p. 80) that Baron Schlereth had tested the genitalia of *poly-sperchon*, *coretas* (*alcetas*), and *argiades*, and found them "practically identical." This matter, being easily tested on the dried bodies of the specimens in our collections, proves to be not quite as satisfactory as the Baron's conclusions suggest, and Bethune-Baker, writing to us on March 15th, 1908 (before the publication of our notes, but with the proof before him), says:—" *E. argiades* and *E. alcetas* (*coretas*) are, I believe, on the whole, distinct. I do not see why they should not interbreed, so far as the genitalia are concerned, though the genitalia differ somewhat. In *alcetas* the hooks of the clasp at the lower extremity are very decidedly longer than in *argiades*, the upper club-shaped extremity is stouter in *alcetas*, whilst the hooks of the tegumen, in both species, are short dagger-like processes, but are decidedly more slender in *alcetas*. The type in both is quite similar, the development in *alcetas* is progressive in the clasp, and perhaps I might say retrograde, or at least reduced, in the tegumen." Dr. Chapman has also given the matter his attention, and notes (*Trans. Ent. Soc. Lond.*, 1908, p. 371):—"The facts concerning the ancillary appendages are, without going into descriptive details, that the two forms have different appendages, that the differences are very slight, but very distinct and very constant, so slight that one can quite understand their being overlooked . . . These slight differences affect several distinct parts of the structures. The clasps in *alcetas* are wider and heavier basally, the outer angle of the base being full, and receding somewhat, and more firmly attached to the basal ring. In *argiades* this attachment is less, and the angle looks much more rounded off than in *alcetas*. The long spine of the clasp is, in *alcetas*, long, slender, and straight, as compared with the shorter, thicker, and more curved form in *argiades*. The spiculation of its extremity affects a rather greater length than in *argiades*. This form of the spine makes what we may call the shoulder more sloping in *alcetas*, more square and angular in *argiades*. The soft hair-clothed division of the clasp is more slender in *argiades*, and carries only two hairs at most, lower than a point approximately level with the division of the clasp into the two branches; below this, where the two clasps oppose each other, is a considerable glabrous surface; this area, glabrous in *argiades*, carries a considerable number of hairs in *alcetas*. The hooks or parameres of the dorsal piece (tegumen) are larger and more slender in *alcetas*, the terminal portion, though longer, is not so sharp as in *argiades*, and the latter has a large rounded flap at the base of this terminal portion that does not exist in *alcetas*. The aedoeagus is more robust in *alcetas*, more slender in *argiades*."

These facts go far towards proving the specific distinctness of *alcetas*. We hope soon to get from our German and Hungarian confrères—Messrs. Gillmer and Aigner-Abafi—a differential summary of the facts relating to the life-habits, habitats, etc., of these insects in Germany and Hungary respectively. These facts are certainly most important.

Having to treat *Everes argiades* as a British species, its life-history had to be prepared for our work *A Natural History of British Lepi-*

doptera. The previous point of view that *alcetas* was a form of *F. argiades* led us to work out for this purpose all that was known (or at least recorded) of *alcetas*. These details would be somewhat superfluous now in our work, but appear to be of sufficient importance to students of Palearctic lepidoptera to warrant us in placing the facts of the other side tending to support the view that *alcetas* is specifically distinct from *argiades*, before lepidopterists generally. We, therefore, add our own summarised history of

EVERES ALCETAS, HOFFMANSEGG, AND ITS AB. DECOLORATA, STAUD.

SYNONYMY.—*Alcetas*, Hoffmansegg, "Ill. Mag.," iii., p. 205 (1804); Hübner, "Schmett. Eur.," text p. 51 (1806); Tutt, "Ent. Rec.," xx., p. 79 (1908). *Tiresias*, Hb., "Eur. Schmett.," pl. lxx., figs. 319-321 (1799). *Coretas*, Ochs., "Die Schmett.," i., pt. 2, p. 60 (1808); Meig., "Eur. Schmett.," ii., p. 14, pl. xlv., figs. 5a-b (1830); Bdv., "Gen. et Ind. Meth.," p. 10 (1840); Dup., "Cat. Meth.," p. 31 (1844); Sélys, "Mém. Soc. Rcy. Sci. Liège, ii., pt. i., p. 31 (1845); Heydrch., "Lep. Eur. Cat. Meth.," p. 15 (1851); Westd. and Hew., "Gen. Diurn. Lep.," ii., p. 490 (1852); Led., "Verh. zool.-bot. Gesell.," p. 19 (1852); Gerh., "Mon. Eur. Schmett.," p. 8, pl. xi., fig. 5 (1853); Staud., "Cat.," 1st ed., p. 4 (1861); 2nd ed., p. 9 (1871); Frey, "Lep. Schweiz.," p. 14 (1880); Kane, "Eur. Butts.," p. 35 (1885); Rühl, "Europ. Gross-Schmett.," i., p. 229, 750 (1895); Tutt, "Brit. Butts.," i., p. 185 (1896); Staud., "Cat.," 3rd ed., p. 77 (1901); Wheel., "Butts. Switz.," p. 44 (1903); Jachon, "Rev. Ent. Russ.," iv., p. 96 (1904); Brown, "Bull. Soc. Ent. Fr.," p. 11 (1905); Obth., "Feuille des Jeun. Nat.," 4th ser., p. 149 (1906); Grund, "Int. Entom. Zeit.," xxi., p. 125 (1907); Rebel, "Verh. z.-b. Ges. Wien.," lviii., p. 32 (1908). *Polysperchon*, Hb., "Verz.," p. 69 (*circ.* 1818); Sélys, "Mém. Soc. Roy. Sci. Liège.," ii., pt. i., p. 31 (1845); Mab., "Bull. Ent. Soc. Fr.," pp. 64, 70-71 (1877); Wheel., "Butts. Switz.," p. 44 (1903).—*Papilio alcetas*.—Pale blue butterfly. Wings above in the ♂ shaded sky-blue, bordered with black, and, on the hindwings on the border of the fringes, at least towards the tail, marked with distinct black spots; ♀ above wholly brown, fringes in both sexes whitish; undersides pale ash-grey, with the usual spots and bands finely marked, but without a trace of an ochre-colour suffusion. Habitat: Austria. This and the preceding species (*amyntas*) are delicately tailed (Hübner). LOCALITIES: AUSTRO-HUNGARY—Hungary—1st brood 19mm.-26mm.; 2nd brood, 22mm.-29mm. Budapest, Peszér, Nagyvárad, Pécs, Pozsony, Tarnabok, Kocsócz, Arvaváralja, Gölnczbánya, Eperjes, Nagyszeken, St. Gothard, Lipik, Fiume. Near Eperjes sometimes coloured as *L. optilete*; the ♀ rarely tinged with blue (Aigner-Abafi). LOWER AUSTRIA: Hernstein, singly (Rogenhofer); Carinthia—the southern foot of the Petzen in the Topla-Ditch at Schwarzenbach, July 12th, at most places in road, no typical forms (Höfner); Dalmatia (Mann); Tyrol—Bozen, July 8th, 1903, with typical *argiades* (Lowe); Mendel, July, 1895 (Lemann), July 12th, 1904 (Rowland-Brown); Campiglio, July 10th-25th, 1895 (Lemann). FRANCE: Alpes-Maritimes (Bromilow); Basses-Alpes—Digne, June 15th, 1890 (A. H. Jones); April 29th, 1897 (Chapman); June 7th, 1899, tails small (Brown); May 11th, 1902, on the mtns., in the direction of Les Dourbes, at considerable elevation (Rosa); May 7th, 1903, May 2nd, 1905, ♂ and ♀ *in cop.* (Sheldon); May 19th, 1906 (Reverdin); Basses-Pyrénées—St. Jean de Luz (Mabille); Gironde—Bordeaux (Gaschet); Haute-Savoie—July 7th, 1905, at Brides-les-Bains, July 29th, 1905, at Salins (Reverdin); Puy-de-Dôme—Capucin, Mont Dore (Kane); Pyrénées-Orientales—from 500m.-700m.; double-brooded, at the foot of the Mont de Fenilla, between Villefranche de Conflent and Vernet-les-Bains, May, 1886, May-June, 1900; in the Bois de Pinats, July, 1886, 1891, 1894, 1895, 1906; ♀ invariably black above, without orange marginal spot on hindwings; both sexes lack orange beneath; the ♂ does not vary, nor does the ♀ except in size (Oberthür); June 18th-28th, 1905, July 16th, 1906, at Vernet (Rowland-Brown); June 16th, 1907, at Vernet (Keynes). [GERMANY: Pomerania—Once in the Schrey, July, 1868 (Hering); forest of Crummenhagen, rarely (Spormann); Hanover—reported from Osnabruck (Jammerath); Posen—in June, on roadside near Kobylepole (Schultz).³] ITALY: Tuscan Appenines—Vallombrosa 800m.-900m., very local, August (Verity). SWITZERLAND: Valais, double-brooded,

* Can anyone say whether these localities still produce *coretas*, or is a specimen of Spormann, Jammerath and Schultz still available for inspection.

July 21st, 1899, in the Pfynwald; July 22nd, 1899, at Martigny; July 19th, 1900, May 20th, 1901, June 3rd-4th, 1902, at Branson, on the marshy ground both sides of the river at the Rhone bridge; May 13th, 1903, between the railway and the Rhone, about a mile S.W. of Sion (Wheeler); August 3rd-4th, 1905, in the Pfynwald (Keynes); July 10th-11th, 1906, at Branson, July 11th-20th, 1906, at Martigny (Reverdin); May 30th, 1907, ten ♂s, 25mm.-29mm., on railway-bank, east of Sion, covered with *Anthyllus*, *Trifolium*, *Medicago*, *Lotus*, etc., and flying with *Polyommatus icarus*, *Agriades bellargus*, *Plebeius argyrognomon*, etc. (Tetley); Bex (Murray); Ticino—Reazzino, June 6th, 1903, fairly common; Monte Bré, at summit, June 13th, 1903 (typical *argiades*, captured lower down on this mountain, July 24th, 1904) (Lowe).

Hübner figures (*Eur. Schmett.*, pl. lxx., figs. 319-321) an Everid species—Fig. 319, ♂, bright blue; fig. 320, ♀, entirely fuscous, no orange on upperside; fig. 321, ♀ underside, spots rounded, submarginal row of forewings angulated; caudal spot on hindwing with slightest possible trace of orange lunule=*tiresias*, Hb.

He also figures (*Eur. Schmett.*, pl. lxx., figs. 322-324) an Everid species—Fig. 322, ♂, rather more violet-blue, but still bright; fig. 323, ♀, fuscous, with purple tinge at base of forewings, and at base and in median area of hindwings, also orange crescents on hindwings; fig. 324, ♀ underside, spots lineated, submarginal row of forewings straighter; ground colour bluer; two caudal spots on hindwings orange-coloured=*amyntas*, Hb.

The undersides of these two insects indicate a recognisable difference, of which that of *amyntas* is almost typical of what we now know as *argiades*, and that of *tiresias* as *alcetas*. This difference Hübner evidently recognised. Hoffmansegg, in 1804, observed that the insect figured as, and called, *tiresias*, by Hübner, was not *tiresias*, von Rott., so he renamed it (*Ill. Mag.*, iii., p. 205), without description, *alcetas*. In 1806, Hübner described the insects he had figured, on pl. lxx., some years earlier, and adopted (*Eur. Schmett.*, text p. 51) Hoffmansegg's name *alcetas*, for figs. 319-321, but especially noted it as having "no trace of any ochre-coloured suffusion on the underside," although he had feebly indicated such a trace in his figure (321). In 1808, Ochsenheimer states (*Die Schmett.*, i., pt. 2, p. 60) that he "had seen an aberration (perhaps a distinct species) in Schiffermüller's collection, under the name of *coretas*, in which the reddish-yellow spots and silvery centres were both entirely absent." Ochsenheimer's work, being much cheaper, was more generally distributed than Hübner's, and so it happened that, while Hoffmansegg's (and Hübner's) name *alcetas* was overlooked, *coretas* came into general use for the insect with no orange crescents on the underside of the hindwings, directly above the tail. Another reason for this was Hübner's own action, for, about 1816, in the *Verzeichniss*, p. 69, he erroneously referred his figures of *tiresias* (*Eur. Schmett.*, pl. lxx., figs. 319-321) to *polysperchon*, Bergstr. At any rate from this time the insect was known as *coretas*, Ochs. (except in France where it was known as *polysperchon*). It may be noted that Staudinger repeated this blunder (*Cat.*, 2nd ed., p. 9), referring both *tiresias*, Hb., and *alcetas*, Hb., to *polysperchon*, Bergs. It is clear that Staudinger could never have compared these figures.

Ochsenheimer's statement that *coretas* appeared to be an aberration of *amyntas* (*argiades*) has been generally accepted, nor does his suggestion that it was possibly a distinct species, appear to have been followed up, nor has the fact that Hübner and Meigen treated it as a

distinct species been noted. Hence up to the time of publication of Staudinger's *Catalog*, 2nd ed., p. 9, there appears to have been no general suspicion that it was anything except what he called it, *viz.*, "*ab. coretas*, subtus maculis rufis nullis." Mabille, however, in 1877, challenged the general opinion (*Bull. Ent. Soc. Fr.*, 1877, pp. 64, 70-71), stated that the insect he captured at St. Jean de Luz, was absolutely identical with Hübner's *tiresias*, figs. 319-321, that the name *polysperchon* was erroneously applied to it in France, and that the larva, which was undescribed, lived he believed, in "les gousses de l'ajonc." It is remarkable that this statement did not attract Staudinger's notice, and that he persisted in the erroneous synonymy of the various forms of this species in his *Catalog*, 3rd ed., p. 77. In the meantime, however, in 1886, Staudinger had himself described a colour aberration of this *coretas* (rect. *alcetas*) form as *decolorata*, from south-eastern Europe—Hungary, Roumania, and Bulgaria—several specimens of which are in the British Museum collection, under the name *coretas*.

In 1904, Jachontov raised the question of the specific distinctness of *coretas* (rect. *alcetas*). This paper (*Rev. Ent. Russe*. iv., p. 96) is in Russian, but he gives, in Latin, the following gist of his argument: "A *L. argiade*, Pall., differt non solum alis subtus maculis rufis nullis (quod insigne apud Staudinger et Rebel affertur) vel subnullis, sed etiam, magnitudine paulo majore, codicula alarum posticarum duplo brevior, pagina superiore ♂ lætius cærulea, tenerius nigro-marginata, punctorum seriei externæ dispositione, qua *L. coretas* cum *L. fischeri* congruit. Patria—Germania, Russia centr. orient et merid., Caucasus, Pontus. In Austro-Hungaria, Rumania, et Bulgaria habitat var. (non *L. argiadae* ab.) *decolorata*, Staud., pagina superiore ♂ viridi-cærulea. Volat Junio." Here it will be remarked he notes two important items, *viz.*, that *alcetas* (1) need not be *absolutely* without fulvous on the underside of the hindwings, (2) that the submarginal row of dots on the underside of the hindwings is different from that of typical *argiades*. Both these items are important as agreeing with characteristic details of Hübner's *tiresias*, fig. 321, and also as agreeing with the undersides of all the examples of this form in the British Museum collection. Jachontov's note was followed by others, *viz.* (1) Brown (*Bull. Soc. Ent. Fr.*, 1905, p. 11), who claims that the Bordeaux *coretas* are distinct, (2) Oberthür (*La Feuille des Jeunes Naturalistes*, 4th ser., p. 149, 1906), who claims that the *coretas* of Digne, and the Eastern Pyrenees, are specifically distinct from *amyntas* (= *argiades*), both species occurring at Digne, (3) Grund (*Int. Entom. Zeit.*, xxi., 1907, p. 125), etc.

As the original specimens of *alcetas*, Hb., and *coretas*, Ochs., were captured by the Vienna collectors of 125 years ago, it was well that Rebel should examine the question. This he does (*Verh. zool.-bot. Gesell.*, lviii., pp. 32 *et seq.*), reiterating the specific identity of the two forms. He bases his argument on the facts that (1) *coretas* occurs throughout the Vienna district and the Balkan district generally, with (a) the spring brood *polysperchon*, and (b) the summer brood *amyntas*, of *Everes argiades*. (2) *Coretas* presents, in neither brood, no distinguishable seasonal dimorphism from that exhibited by *E. argiades*. (3) The occurrence of intermediate forms between *argiades* and *coretas* in the differential characters—the orange-red crescents, and the silver kernels to the caudal spots on the underside of hindwing. (4) The similarity of the ♂ genitalia, as determined by Schlereth, in *poly-*

sperchon, *argiades*, *coretas*, and *decolorata*. To this we would add (5) its apparently rare and casual occurrence as an aberration of *L. argiades* throughout the greater part of Russia, Germany, and Central Europe, thus contrasting with its special development and isolation in the Valais, certain parts of France, etc.

All these points want careful examination before the specific distinctness of *alcetas* can be fully granted. With regard to them we may note (1) closely allied species often occur as first and second broods at the same time, on the same ground, under similar conditions, e.g., *Agriades bellargus* and *A. corydon* in the Alpes-Maritimes; *Cupido sebrus* and *C. minima* in the Valais, Basses-Alpes, etc. (2) The seasonal dimorphism of size (small vernal form) may be due to a parallelism of the life-habits of the early stages; the seasonal dimorphism of colour may be more marked than Rebel suggests, for Aigner-Abafi says of *coretas*, "the ♀ rarely tinged with blue," and we know that the early brood of *argiades* is sometimes much tinged with blue. (3) Are "the orange-red crescents," and "the silver kernels to caudal spots," really differential characters? We think the orange crescents are, although it is true that *alcetas* sometimes has a faint trace of such crescents, and that the weakest *argiades* have barely more than a trace, but may not this be mere parallelism in allied species of a common character? The silver kernels are very uncertain, only two of our long series of *argiades*, and very few examples of those in the British Museum collection, show them; we have seen no *alcetas* with them. As bearing on their uncertain nature, it is to be noted that an occasional specimen of *Polyommatus escheri* may bear them. (4) The genitalia of *alcetas* and *argiades* differ apparently constantly in minute particulars according to Chapman's dissections. (5) This we consider the most difficult point to explain; why should *alcetas* occur as an occasional rare aberration among *argiades*, in both broods, in places where it appears to have no racial standing? Of course the records of this occurrence are often made by collectors none too far advanced. Can it be that most (or all) of these examples are wrongly named by persons confused by the misuse of the various names? [Sély's-Longchamps paper (*Mém. Soc. Roy. Sci. Liège*, ii., pt. 1, p. 31) well shows the state of muddle even of the best lepidopterists; he defines *coretas* as "having the fulvous anal lunule very small, the ocellated spots on the underside small, and the hindwings almost without the little tail (which would suggest a specific difference);" he further defines "*polysperchon* (which he says = *tiresias*, Hb.)" as "of small size without the yellow lines at the anal angle." If Sély's-Longchamps was in this state of mind, what might mere collectors be recording as *coretas*?] The distribution of *coretas* wants careful determination and study.

There are, in the British Museum collection, five ♂s and five ♀s (mixed with several small *argiades*, some of Zeller's bred *polysperchon*, etc.) under the name *coretas*, also one ♂ and one ♀ under the name of *decolorata*. These twelve are all eastern (as far as labelled) specimens—Slivno, Bagovitza, Eperjes. They are all characteristic *alcetas*, to be determined on the underside at a glance (1) by the uniform ground colour, (2) by the roundness of the spots, (3) by the angulation of the submarginal row of spots on the forewings, (4) by the character of the spots at the base of the caudal appendages, which

sometimes show the faintest trace of fulvous, but usually do not. Comparison with Hübner's figs. 319-321, *tiresias*, shows that the specimens in the Brit. Mus. coll. and Hübner's figures are identical. In spite of an occasional apparent approach between *argiades* and *alcetas* in the roundness of the spots, in the direction of the submarginal row of spots of the forewings, and of the faintness of the fulvous crescents, one is convinced that these *alcetas* are a thing apart, and that the similarities are parallelisms in two different forms, and not variations of the same form. We are inclined, therefore, to take these items as differential, *i.e.*, the characters that Hübner figured, rather than those he described. Looking at the spots in mass, one sees that (1) *E. argiades* has the dots on the underside of the forewings almost always elongated, in the form of little streaks, very analogous to those of *Celastrina argiolus*, and almost always seven in number. (2) *E. alcetas* has the dots more rounded, with a slight tendency to elongation in the form of little streaks, rarely so much as in *E. argiades*. The dots may number seven, but vary greatly.

(To be concluded.)

Agrilus biguttatus, F., etc., in Sherwood Forest.

By H. St. J. K. DONISTHORPE, F.Z.S. F.E.S.

I spent two days in July last at Sherwood, chiefly with the object of trying to find *Pyropterus affinis*. In this I was successful, as I captured a considerable number of this very local beetle. Most of them were at the foot of a large tree, on and under dead leaves and bits of bark, but I swept other specimens off bracken in various parts of the forest. My best and most remarkable capture, however, was the very beautiful and exotic-looking Buprestid, *Agrilus biguttatus*, F.! I found the first specimen on a fallen tree, and could hardly credit my good fortune. After a long and exhaustive search, I traced it to its headquarters in a large oak-tree near by. I found its borings in the thick bark, and observed what looked like the face and mandibles of a Chrysid or Hymenopteron, at the entrance to a small hole, this, on being dug out, proved to belong to the *Agrilus*. After this, more were noticed, and as many as five at a time were dug out of a few inches of bark. Later in the day, specimens came out on the tree, and on the bracken and low branches. In all I took over 60 specimens, but could have taken 600 if I had wanted to, as I only removed a very small portion of the bark. This is a very interesting capture, and a fine addition to the Midland fauna. It is about 30 years since the beetle occurred in Britain. It used to be taken by Dr. Power and others at Darent Wood, but seems to have quite disappeared from that locality. This is its only locality, beyond a few old records in Stephens. Of other things I took may be mentioned, *Cistela ceramboides* in an old tree; several *Eryx ater* under bark; *Cryptocephalus querceti*, beating oaks; *Anaspis garneyi* and *Mycetoporus angularis* by sweeping; and *Megacronus cingulatus* in rotten wood. Specimens of *Clerus formicarius* were found in the bark with the *Agrilus*, and flying and settling on the trunks of the tree. This looks as if they were parasitic on the *Agrilus*.

NOTES ON COLLECTING, Etc.

A DEAD SPECIMEN OF ANOSIA ARCHIPPUS FOUND ON THE CLIFFS AT BEMBRIDGE.—On September 13th I was searching the grass with a

lamp on the top of Bembridge Down in the Isle of Wight, for newly-emerged *Aporophylla australis*, when I found lying dead in the grass a specimen of *Anosia erippus* var. *archippus*. It was not yet stiff, and had almost certainly not been there more than 24 hours, as a friend and myself had been hunting the same spot every night.—G. H. HEATH, 277, Brockley Road, S.E. September 15th, 1908.

A PERSONAL EXPLANATION.—Mr. Martineau's note in the May number of the *Ent. Record*, p. 119, calls for a brief reply, as, though true in substance, it gives a false impression. It is true that *before publication* of my former note in the March number I learnt that joint work was in progress, but it was not until *after* it was probably *already printed*, and long after it was sent in; moreover, I was *not* informed that a paper was to appear in the March number, or that it was proposed to deal with the subject of my former note. As a matter of fact, the error to which I called attention was not even referred to when the article did appear. I am at a loss to understand Mr. Martineau's note, as the sole object of my communication was to secure to him the credit of his discovery.—COLBRAN J. WAINWRIGHT, Hon. Sec.

SECOND BROOD OF PLATYPTILIA GONODACTYLA.—It may be worth while noting that specimens of the second-brood of this species were seen near Hither Green Station on the 15th. This would appear to be, according to the references to the second-brood noted (*Nat. Hist. Brit. Lep.*, v., p. 215), about the right date for this brood in the south of England. One wonders what the many July and August dates in the Clyde district (*op. cit.*) indicate. They must surely be those of a second-brood, although, excluding the unusual 1893 date of May 13th, the species does not appear to have been noticed there earlier than June 13th (1894), whilst, in 1888, we ourselves at Westcombe Park bred a large number of imagines, which continued emerging till July 1st, from larvæ collected in May, and at Corsemalzie (Wigtownshire) the second-brood apparently is recorded as late as October 29th (1898). Are these July and August examples in Scotland extensions of the early brood? or are they partly late examples of the early, and early examples of the late, brood? Is there ever any tendency to a third brood? It is a common species where it occurs, but one finds difficulty in fitting altogether the many recorded dates in widely different localities into their respective broods.—J. W. TUTT, Westcombe Hill, S.E. September 18th, 1908.

HYPONOMEUTA CAGNAGELLUS IN SEPTEMBER.—There have been two or three references to this species in our pages during the current year, showing that its habits in the London district strike one as being a bit odd. Twenty or thirty years ago, one used to find larvæ on *Euonymus europæus* in the Strood district, and bred the imagines towards the end of June or in early July, and it was always supposed to be one-brooded, the gregarious larvæ always apparently keeping pace in the same web, pupating almost simultaneously, the imagines doing the same. But of recent years, since the larvæ have become so very abundant on *Euonymus japonicus*, in the London district, one has become accustomed to seeing imagines on the fences around Westcombe Park, Blackheath, Lewisham, etc., from June until September. Yet this year webs from Lewisham, Blackheath, Ilford, and elsewhere, collected from *E. japonicus*, produced all their imagines simultaneously in the first fortnight of July. I saw a web or two of larvæ, in

Lewisham, as late as the last week in June, but these must have produced imagines say by the last week in July, and casual observation has detected none later, yet larvæ must have been there, as I have observed imagines continuously since my return from the Continent (about August 20th) until the present date, one observed quite fresh to-day, September 20th. The questions that arise in my mind are (1) whether these late August and September examples on *E. japonicus* are a partial second-brood, (2) whether, if so, there is ever a partial second-brood on *E. europæus*, (3) whether this condition has been induced on *E. japonicus* by the abundance of food, and the fact that this species is evergreen, so that food is forthcoming throughout the year, and that late larvæ have nothing to fear from the falling of the leaves, as in the case of their natural food, *E. europæus*? It would be interesting to have the actual observations of someone who has really paid attention to the natural history of this species, and who has definite facts bearing on any of these points. If not this year, perhaps next year, these little puzzles may be cleared up.—J. W. TURR.

IMMIGRATING *PIERIS BRASSICÆ*.—On the afternoon of August 1st, while sitting on the end of Eastbourne Pier, I had the pleasure of witnessing an immigration of *Pieris brassicæ*. It was a lovely afternoon, with a fairly strong westerly wind. I had only just arrived from London, and was watching the people landing from the steamer. My thoughts were not on entomology, but the number of *P. brassicæ* flying about the head of the pier and visiting the flowers on the ladies' hats arrested my attention. Getting no satisfaction from that, they flew towards the shore. Hoping that an immigration was taking place, I waited till the steamer had gone, and then kept a sharp look-out. No sooner had the steamer moved away, than I could see them coming in from the south-east, flying quite close to the water, each wavelet seeming to produce one or two specimens, and so it kept on till I was forced to leave for tea. As far as I could see on either side of the pier, the same thing was going on, but how long before I arrived or after I left I cannot say, but for the remainder of my fortnight's stay in the town, they swarmed everywhere. I watched some sparrows in a garden busily engaged catching and eating them, when suddenly a flash of yellow and black appeared (a ♂ *Colias edusa*), hovered over a flower, and was gone, giving a sporting chance to the sparrow, which, although it made an attempt, quite failed to capture it. At Brighton and Newhaven my attention was drawn to the number of *P. brassicæ*, where they were equally abundant, whereas at Margate they are nothing like as plentiful (August 22nd-28th) as they are in normal years.—C. W. COLTHRUP, 127, Barry Road, East Dulwich. August 28th, 1908.

COLIAS EDUSA AT EASTBOURNE.—I saw two specimens on August 12th at Eastbourne, and heard of five others being taken. At Margate I saw a freshly-emerged ♂ on August 24th, and know of nine others being taken up to that date, and one ♀. I took three ♂s August 28th, and three ♂s August 29th.—C. W. COLTHRUP.

MANDUCA ATROPOS IN KENT.—I had a full-fed larva given me on August 26th at Deal, taken on a potato plant.—C. W. COLTHRUP.

PAIRING HABITS OF BUTTERFLIES.—In going over my notes for the last few years, I find the following, which may be of interest:—

August 20th, 1904.—	<i>Epinephele jurtina</i>	paired, when disturbed	♀	carried	♂.
July 29th, 1905.—	♀ <i>E. jurtina</i>	observed		carrying	♂.
July 29th, 1905.—	♂ <i>Agriades corydon</i>	"		"	♀.
August 10th, 1907.—	♂ <i>A. corydon</i>	"		"	♀.
August 2nd, 1908.—	♀ <i>E. jurtina</i>	"		"	♂.
August 28th, 1908.—	♀ <i>Coenonympha pamphilus</i>	"		"	♂.
—C. W. COLTHRUP.					

NOTES ON LIFE-HISTORIES, LARVÆ, &c.

ABERRATION OF LARVA OF *PAPILIO MACHAON*.—Whilst taking a walk to-day, I came across a small boy with two fullgrown *P. machaon* larvæ in his hot hand, and these he made over to me on being suitably bribed. They are both rather interesting cases of melanism. In one the green is replaced by black, with the exception of the underside, which is about half black, and of two very fine green lines on either side of the rows of six orange-red spots on the thoracic and four last abdominal segments; on the central segments these fine green lines do not extend much further than the subspiracular spots. The second has several of the orange spots bordered with white, and the fine green lines are extremely pale in colour. I have never seen anything like this among the swarms of *P. machaon* larvæ that I have come across in French Switzerland, and so send you this description of them in case of it being of use.—P. A. H. MUSCHAMP, F.E.S., Stäfa. *September, 20th, 1908.*

THE EGG-LAYING OF *ACIDALIA IMMUTATA*.—A ♀ *Acidalia immutata*, caught on a bog above Stäfa, July 30th, 1908, laid a large number of pale yellowish eggs in the box in which she was confined. They were elongated, and ribbed longitudinally (apparently about ten ribs, as far as can be told by means of a pocket lens), changing rapidly to bright yellow and then to orange-red. The object of this note, however, is to record that, whilst a few of the eggs were laid with the long axis parallel to the plane of deposition, *i.e.*, as typical flat eggs, the others were laid either as upright eggs (with the micropyle as the apex), or at some angle that falls somewhat short of the perpendicular. I have noted this peculiarity in other Acidaliids, but not, I think, in this species.—J. W. TUTT.

UNUSUAL FOODPLANTS OF WILD LARVÆ.—It is often interesting to note how, in captivity, larvæ will take to foodplants which are apparently not natural to them, but it is not so often that we find the same thing occurring with wild larvæ, so perhaps the following may be of interest. About a month ago—the middle of August—I happened to go one night into my greenhouse, where I had placed some cages containing pupæ ready for emergence, and my eye fell on a plant of begonia, from which hung suspended a number of small larvæ. At that time they were not large enough for me to be certain as to the species, but I carefully sleeved the plant, and they are now full-fed and prove to be either *Tephrosia bistortata* or *T. crepuscularia*, probably the former. My second experience was last spring. Some year ago I had captured here a specimen of *Mellinia ocellaris*, the food-plant of which is poplar, and particularly, it is believed, the catkins. My only poplars here are a row of black poplars which line the carriage drive to this house, and in April I noticed these catkins falling, and determined to try whether by sweeping them up I could secure larvæ of *M. ocellaris*. From about a bushel of catkins, sticks,

and rubbish roughly swept up I eventually secured eight or nine larvæ, evidently Xanthiid, and which, consequently, I fondly hoped were those I wanted. Instead, however, they proved, on emergence, to be *Xanthia cerago* and *Mellinia gilvago*, one of which species habitually feeds on sallow and the other on wych-elm. All the specimens were beautifully large and well-coloured.—PERCY C. REID, Feering Bury, Kelvedon. September 16th, 1908.

CURRENT NOTES.

Dr. Joy adds (*Ent. Mo. Mag.*) *Anisotoma flavicornis*, Ch., to the list of British coleoptera, on the strength of specimens captured on June 8th and following days at Bradfield (?), by sweeping grass growing by the side of a watercress bed. The same observer describes a new form of *Sunius angustatus* under the name of *lyonessius* from the Scilly Isles, where he also captured *Cryptophagus hirtulus*, Kr.

The Rev. F. D. Morice adds *Coelioxys agra*, Lep., to the list of British bees, the specimen having been taken some years ago in the New Forest.

Mr. Malloch adds *Eccoptomera microps*, Mg., and *Agromyza bicornis*, Kalt., to the list of British diptera, the former taken in moles' nests near Oxford and Bonhill (Dumbarton), widely distant localities, and the latter from the same localities as well as from the Clyde district, probably Glasgow.

Commander J. J. Walker represented the Entomological Society of London at the Jubilee Commemoration of the Oxford University Museum, held at Oxford University on October 8th.

In his paper "On the British species of *Phora*" (*Ent. Mo. Mag.*) Dr. Wood describes more new species, viz., *retroversa* (Stoke Wood), *fuscinervis* (Chippenham Fen, Bonhill), *paludosa* (near Ross, banks of the Wye, and Monnow, etc.), *spinigera* (Ashperton Park, Stoke Wood), *campestris* (distributed as far north as Bonhill).

Mr. Champion points out that two species have been confused in collections under the name *Calodera nigrita*, Mann., one of the true *C. nigrita*, Mann., the other *C. protensa*, Mann.; the true *C. nigrita* occurs in the London district, Reigate, Woking, Iwade, etc., the other has only yet been recognised from near Colchester.

Mr. Edward Saunders affirms that *Halictus longulus*, Smith, is merely a small form of *H. malachurus*.

The Hon. N. C. Rothschild describes (*Ent. Mo. Mag.*) a new flea taken in July, in the Scilly Isles, from the nest of a puffin, by Dr. Joy, as *Ornithopsylla laetitiae*.

Mr. Champion records (*Ent. Mo. Mag.*) *Aleochara crassiuscula*, Sahlb., as a British insect, on the strength of specimens taken under dung on the denes at Great Yarmouth, in May, by Mr. W. West, of Greenwich.

Mr. Newbery adds *Ceuthorrhynchus parvulus*, Bris., to the British list from specimens taken in June, by Mr. P. de la Garde, on *Lepidium heterophyllum*, at Braunton, Devon.

Mr. Malloch describes *Phora intermedia* as a British species, and states that it is very common at Bonhill, in May and June, every year. He further adds the Dipteron, *Hyadina nitida*, Meq., to the British list from a specimen taken last September (1907), at Bonhill.

Mr. G. T. Bethune-Baker has recently published three important entomological papers, viz., "Description of new species of Butterflies from Africa and New Guinea," with two plates (*Proc. Zool. Soc. London*); "Description of new African Heterocera" (*Annals and Mag. of Nat. History*); and "New Heterocera from British New Guinea" (*Novitates Zoologicae*).

Mr. W. E. Thornthwaite's large collection of British Macro-Lepidoptera is to be sold at Stevens' on October 27th. We understand that the Micro-Lepidoptera will follow at a later date. There are in the collection a number of very rare species, some of Mr. Thornthwaite's own capture, others that have been purchased at Stevens' from well-known collections during the past 30 years. Among the best things, are *Heliothis scutosa* and *Noctua flammata*, the capture of which is recorded (*Ent.*, ix., p. 18); the other certain British examples of these species are only one or two in number; possibly in the case of *H. scutosa*, that which was in the "Barrett coll.," and which Mr. Thornthwaite gave Mr. C. G. Barrett (*Ent.*, x., p. 99), and that captured by Mr. Campbell (*Ent. Mo. Mag.*, xv., p. 137) are the only other really well-authenticated examples; and in the case of *N. flammata* the number of certainties is perhaps less. A fine example of *Leucania unipuncta (extranea)* (taken at Dartmouth if we remember rightly) he also set great store by, and there are many other good things.

SOCIETIES.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—*August 27th, 1908.*—*DICTYOPTERYX BERGMANNIANA.*—Two series of *Dictyopteryx bergmanniana*, one bred from garden rose and the other from wild burnet rose, notes being read on the different habits of the two broods of larvæ, Mr. R. Adkin. *ABERRATIONS.*—A light form of *Crambus chrysonuchellus*, characteristic of Eastbourne, and two forms of *Eurrhyncha urticata*, one having the marginal spots small, well separated, the other having them coalesced into a wide band, Mr. Turner. *LEUCANIA FAVICOLOR* IN ESSEX.—A specimen of *Leucania favicolor* from Benfleet, Mr. Brown. *SMERINTHUS HYBR. HYBRIDUS*, ETC.—Examples of the hybrid *Smerinthus ocellata-populi* just bred; *Crymodes exulis* from Shetland, including females; living larvæ of *Dicranura bicusps* from Tilgate Forest; *Abraxas grossulariata*, with the hindwings with only rayed marginal spots and the discoidal; a *Melanargia galathea*, the left hindwing of which inclined to var. *procida*, Mr. Newman. *AMPHIDASYS BETULARIA.*—Two *Amphidasys betularia*, one having the basal spot absent on the forewing, but with white discoidal spots, and the other having a large whitish costal blotch on the lower wing, Mr. Cowham. *EUGONIA POLYCHLOROS.*—A bred series of *Eugonia polychloros* from the New Forest, including a dark smoky form, Mr. B. H. Smith. *RUMICIA PHLEAS.*—A specimen showing a complete absence of copper on the lower wings, Mr. Goff. *NEPTICULA ACETOSÆ.*—Mines of *Nepticula acetosæ* from Surrey; notes on the life-history of the species were read, Mr. Sich.—*September 24th, 1908.*—*MACARIA LITURATA* VAR. *NIGROFULVATA.*—A series of bred *Macaria liturata* var. *nigrofulvata* from Delanere ova. Of the fourteen specimens bred, thirteen were of the dark form, Messrs. Harrison and Main. *ABERRATIONS OF LEPIDOPTERA.*—Examples of *Abraxas grossulariata*, including ab. *varleyata*, ab. *nigrosparsata*, dark forms, and a rayed specimen; a very darkly

powdered *Selenia illustraria*; two *Gnophos obscurata* ab. *mundata* from Lewes; a rayed form of *Pieris napi*; a yellow aberration of *Noctua rubi*; and a long bred series of *Argynnis aglaia*, with much variation, Mr. Newman. EUVANESSA ANTIOPA.—A fine ♀ of *Euvanessa antiopa*, taken at Vitznau on August 10th, and a well-marked and brilliant ♀ underside of *Erebia aethiops*, taken at Gersau on July 27th, Mr. Turner. PHOTOGRAPHS OF EGGS OF LEPIDOPTERA.—Photo-micrographs of the ova of *Coleophora virgaureella* laid on the pappus hairs of *Solidago virgaurea*. They were upright eggs, and the young larvæ emerged from the micropyle, Mr. Noad Clark. ABERRATION OF DILOBA CÆRULEOCEPHALA.—A *Diloba caeruleocephala*, bred by his son, in which the "80" mark was blurred and extended, Mr. Step. NEW BRITISH COLEOPTERA.—Specimens of *Aleochara crassiuscula*, a Coleoptera new to Britain, discovered by him at Great Yarmouth, and also the rare and local Homopteron, *Ideocerus scurra*, from Blackheath, on poplars, Mr. West (Greenwich). ABNORMAL LARVA OF TRIÆNA PSI.—A larva of *Triæna psi* having an unusual development of the fleshy "horn," Mr. Moore. LARVA OF ARISTOTELIA HERMANNELLA.—Larvæ of *Aristotelia hermannella* mining a leaf of *Chenopodium album*; reference was made to its colour changes, Mr. Sich.

CITY OF LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—September 1st, 1908.—PUBLIC RIGHTS OF WAY BILL.—A resolution was passed in support of the Public Rights of Way Bill and the Access to Mountains Bill. Exhibits—ARCTIA CAIA ABERRATION taken at Hailsham, June, 1908. The upperwings deep chocolate-brown, with only slight traces of the usual cream ground colour. The underwings smoky-black, with intense black spots, and pinkish margin, Mr. J. A. Clark. NEMORIA VIRIDATA, from Surrey, May and June, 1908, including a female with the usual white lines very faintly marked, and another female, with two white striæ, one on the costa of the hindwings and the other just above the centre of the forewings. Also larvæ of the same species found feeding on *Genista anglica* and heather blossoms, Dr. G. G. C. Hodgson. MALACOSOMA CASTRENSIS from Essex, including a unicolorous buff aberration, Mr. A. W. Mera. PLUSIA MONETA, a series from Hornsey, Mr. J. Riches. September 15th.—SIREX JUVENCUS, a female, 2¼ inches in expanse, taken in his garden at Crouch End, Mr. J. A. Clark. CENONYMPHA PAMPHILUS, a variable series, including a specimen with the ocelli on the underside of the forewings obsolete, Mr. T. H. L. Grosvenor. AGRIADES BELLARGUS.—Pupæ in lightly-spun cocoons of silk and leaves. BRENTIS EUPHROSINE, a bleached specimen taken in Sussex, May, 1908, Dr. G. G. C. Hodgson. ANOSIA ARCHIPPUS.—A specimen found dead in the grass at Sandown, Isle of Wight, on September 13th, 1908, while searching for *Aporophylla australis*, Mr. G. H. Heath. CRYMODES EXULIS from Shetland, including a female which was stated to be rarely captured. ABRAXAS GROSSULARIATA.—A variable series, including var. *varleyata*, from Yorks. DRYAS PAPHIA AB. with upperwings suffused with black, except a small area at the base. CALLIMORPHA DOMINULA, a yellow ab., in connection with which the exhibitor stated that the progeny of this specimen paired with a typical one, were all typical, but that the progeny of these typical specimens produced 25 per cent. of the yellow form, Mr. L. W. Newman. ENODIA HYPERANTHUS VAR. OBSOLETA from Dawlish, July, 1908. CAMPTOGRAMMA BILINEATA, ABERRATION, with inner line on forewings much accentuated, forming a black blotch, Mr. C. P. Pickett.

ZONOSOMA LINEARIA, from Ashford, showing an exaggeration of the central line on the forewings, Mr. L. B. Prout.

REVIEWS AND NOTICES OF BOOKS.

THE SENSES OF INSECTS, by August Forel. [Translated by MacLeod Yearsley, F.R.C.S., two plates, xvi + 324 pp., 10/6 net., Methuen & Co.]—This is a volume we are most pleased to welcome. It contains some of the more important portions of Dr. Forel's writings that are not of a more or less systematic character, though in saying this we are, perhaps, undervaluing his work on the habits, as distinct from the intelligence, of insects. Dr. Forel's name is well-known to English entomologists as a first authority on ants; but those who have made themselves familiar with his researches on their habits, the psychology, and the senses of ants and other insects, are certainly few. So far as this may be due to some of the papers not being too accessible, or to their being in French or German, we shall now find our difficulties in becoming familiar with them removed.

Dr. Forel has been an Hon. Fellow of the Entomological Society of London since 1894; so that it is not due to any want of appreciation of his scientific attainments that we know these dissertations so little as we do. The subject of the volume appeals equally to the comparative psychologist as to the entomologist. It is, however, to the entomologist that we realise more clearly its value. Even to mere collecting it adds efficiency, but to the students of the life-histories and habits of insects, to possess some definite ideas about the outlook on the world which insects have, whether in the region of instinct or intelligence, or, more literally, exactly what knowledge of their surroundings they derive from their senses, not only adds very much to the interest of such researches, but permits the observer to take such a point of view as to enable him to make his observations much more effectively.

The translation is excellent; so far as we have detected it is quite accurate, and it reads as though it had been originally written in English. We observe in one place "reflexes" used for reflections, a word that is archaic except in art and in physiology, where it has special meanings. The translation is dedicated to Lord Avebury, than whom is no greater authority on the senses of insects, and with whom our author agrees on almost all occasions.

As we must regard this as a translation, rather than an original work, we need not discuss at length any of the real material of the book. We may remark, however, that it covers in various directions somewhat different ground to that cultivated by Lord Avebury, and enlarges the outlook we derive from his papers. Besides notes of original observations and experiments, a large part of the volume contains discussions, criticisms, and comparisons of the experiments and conclusions of other observers, and the errors of observation and reasoning on them which not a few have fallen into are pointed out. Except Lord Avebury there is no English author amongst these, and we suspect that it is because English authors are scarce, because references to more or less isolated English observations are not infrequent.

We hope that with Forel's writings thus easily accessible, there will, in the future, be more English work in this field.

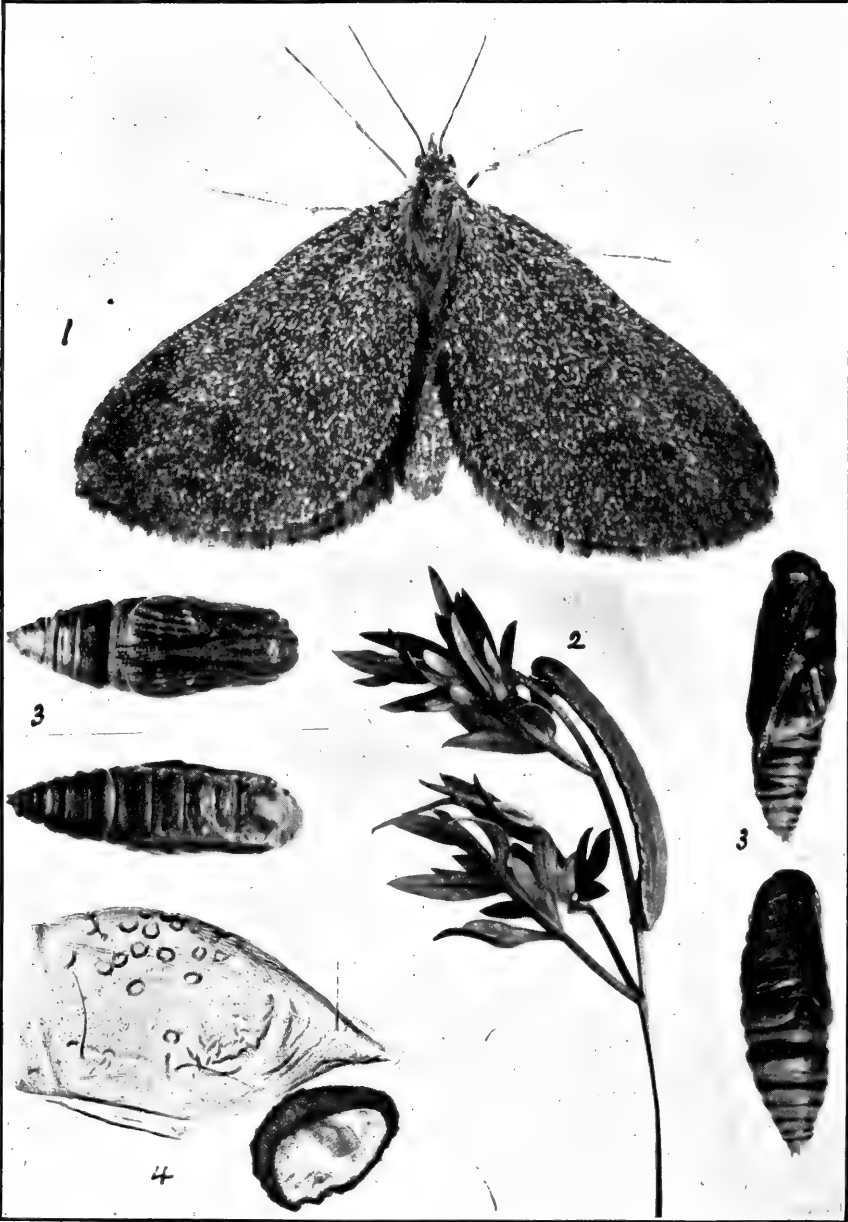


Photo. F. N. Clark & H. Main.

ODEZIA ATRATA VAR. PYRENAICA.

The Lepidoptera of the Bogs above the Züricher-See.

By J. W. TUTT, F.E.S.

In 1895, Dr. Buckell wrote an excellent paper (*Ent. Rec.*, vii., pp. 100 *et seq.*) on "*Coenonympha tiphon* and its varieties," which was followed during the next year by another first-class paper by Mr. Elwes (*Ent. Rec.*, viii., pp. 228 *et seq.*), on the same subject. These dealt, as the titles suggest, with the variation of the species. About the same time Mr. J. E. Robson published (*Ent. Rec.*, vii., p. 265) a paper on "*Coenonympha tiphon (darus)* at home," giving his observations on the habits and habitat of the insect on the Northumberland moors.

One by one our British species have come under my ken, somewhere or other in their native haunts, until at last I could say that I had seen all alive under natural conditions except three—*Chrysophanus dispar*, *Strymon pruni*, and *Coenonympha tiphon*. I have bred the two former, *S. pruni* on several occasions, so was not altogether ignorant of them in life, but *C. tiphon* I had never seen alive. This year, thanks to Mr. Muschamp, the opportunity occurred to hunt this on the boggy uplands above the Züricher-See, and thus to add, as it were, a personal knowledge of the only British species I had really never seen alive.

Dr. Buckell, in his excellent paper, separated the British forms of the species roughly into three groups, which he named "the southern form," "the middle form" and "the northern form," recognising that intermediate forms and areas of admixture were not at all infrequent; the details of their distribution are given (*Ent. Rec.*, vii., pp. 101-2).

It may be here noted that Staudinger (*Cat.*, 3rd ed., p. 66) has made a sad mess of *laidion*, Bkh., which he refers to *tiphon*, von Rott., renaming the *laidion* form (Buckell's northern form) *scotica*, Staud. South follows Staudinger (*Brit. Butt.*, p. 133) blindly into this morass, it being quite evident that neither Staudinger nor South have ever read the original descriptions of *tiphon*, von Rott., and *laidion*, Bkh., for the purpose of comparison, yet the descriptions are readily obtainable. Lepidopterists are advised to follow Buckell in all details relating to this species. His work is excellent, and I have, whilst writing this, all his MS. notes and translations before me. It is a pity that more care has not been taken to digest his work before adding another tangle to the already overlaid synonymy. It may be taken for granted that his conclusions (*Ent. Rec.*, vii., p. 103) are absolutely correct.

Roughly it may be said that the specimens from the Züricher-See belong to "the middle form," *i.e.*, in their general characteristics they are most like that which occurs predominantly on the Northumberland moorland bogs, various localities in Ireland, etc., *i.e.*, they are typical *tiphon*, Rott.

It is generally stated that this species occurs on "marshy" ground in Switzerland, *e.g.*, Wheeler says that "it is confined to marshy places," and the "Weesen marsh," the "Weissenburg marshes," "a sloping marshy field on the left of the road to St. George's," etc., are specially noted. Now all wet ground may rightly be said in a sense to be "marshy," but there is great difference between say "the marshes of the Thames and the Medway," open meadows, intersected by great ditches or dykes, and the wet boggy ground occurring inland, often at

a considerable elevation, and with an entirely different flora. These wet spots we, in England, call "mosses," and "bogs," and the one is well-described (*Ent. Rec.* vii., pp. 266-7), on which Robson and Finlay collected in Northumberland, and whence came so many of the examples of "the middle form," so generously distributed by Finlay, that are now in our collections.

It is well to clear up this point, because *C. tiphon* is essentially a "moss" or "bog" insect, not in the usually accepted sense a "marsh" species. Newman calls it the "marsh ringlet," but all the localities he quotes are "mosses" and "bogs." The special flora of these bogs, so amazingly peculiar, yet wide-spread in such habitats, is sure to attract attention, and the tall red-headed bog-grass and sedges, the white fruit patches of *Eriophorum*, *Gentiana pneumonanthe*, *Narthecium ossifragum*, etc., are usually discoverable at a glance. Wheeler gives as foodplants of *C. tiphon*—*Carex*, *Festuca*, *Rhynchospora* and *Eriophorum*. We should be glad of the evidence of the actual rearing of the larva on any species of *Carex*. On the right sort of ground throughout the whole of Europe, North Asia, and North-Western America, this species is to be found; off it, if only for a few yards, one fails to find a single specimen; not that there is not much apparently suitable ground where the species does not appear to occur, but it must have this sort of ground if it is to occur. Rather more than three weeks before I went abroad this summer of 1908, Mr. Muschamp had found the species on the wing in a bog near Staefa, and so hopes of good specimens were not too unduly raised, when, on the morning of July 27th, and again on that of July 30th, with Mr. Muschamp as guide, we set out to visit his locality for *C. tiphon*, in one of the bogs above the north bank of the Züricher-See. We went to get other things, but this species was at any rate to be seen alive, and I had not previously seen it. Up the rapidly-rising road one looked back over the wide expanse of the lovely Lake of Zürich, with the mountains on the other side in the background—up in the hot sun, midst gardens, fields, and orchards, with "swarms" of white butterflies, principally *Pieris rapae* and *P. brassicae*, everywhere. Was ever such a year as 1908 for "white" butterflies in Central Europe? The butterflies in the fields were numerous—but chiefly, even to Britishers, commoners—*Polyommatus icarus*, *Coenonympha pamphilus*, *Epinephele ianira*, with an occasional *Colias hyale*, and *Aglais urticae*, and many *Loweia dorilis*, a small summer form, the ♀ not much flushed with "copper" on the disc of the forewings, although brightly marked on the outer margin, the ♂ appearing to be exceptionally dark. *Augiades sylvanus* occasionally occurred, and, then, on the ditch-sides by the side of the path, one came across swarms of *Enodia hyperanthus*, all with strongly marked ocellated spots. A lovely fresh *Callimorpha hera* flew across the path and settled on a lucerne flower, evidently the first of the season. Soon a pinewood is reached, and the capture of a large fritillary discloses *Dryas paphia*, whilst *Leptidia sinapis* commences to be exceedingly common, and a most interesting observation on the egg-laying of the species being made here increases our interest. An opening into the wood discloses a great bed of flowering thistles, but nothing thereon except a single *Pyrameis atalanta*, a great disappointment. From the rough herbage, a little Pyralid came up in numbers as one walked through it, whilst a single *Merri-*

fieldia niveidactyla (*baliodactyla*) was also netted, the only one seen, although further search was made. *Sesia stellatarum* flew along the cuttings through which the road now passed, and the ground assumed an air of what one instinctively knows as "butterfly" ground. Deciduous trees now formed an open wood, among which wet patches from various spring-heads, and heather-clad slopes, were the most noticeable features. Once tempted in, one found *Anthrocera trifolii*, and an insect that at first glance looked like *A. hippocrepidis*, Stephs., whilst over the scabious flowers were little congeries of *Nemotois scabiosellus*, the ♂s darting swiftly to and fro in the sun some two or three feet above the blossoms, the ♀s resting quietly on the capitula, some apparently egg-laying there. The *A. trifolii* were mostly somewhat small, apparently of the *minor* form, and interesting, but further observation will have to disclose the details concerning the "burnets" taken. Besides swarms of *Enodia hyperanthus*, of which one fine aberration had both forewings very pale, darker at the base, and almost white on the outer margin = ab. *semialbescens*, n. ab., *Epinephele ianira*, the ♂s dark, and strongly spotted on the underside of the hindwings, one with six ocelli, of which the second and fifth are stronger = ab. *ocellata*, n. ab., and *Polyommatus icarus*, little else was here, except a few *Melanargia galathea*, which seemed to be stragglers from some further outlying point, and then, outside again, one pursued the road a little further. A lovely specimen of *Euranessa antiopa* sunned itself on a stone on the side of another cutting, and was promptly made prisoner, whilst a wide open hollow by the roadside disclosed ground of an entirely different character, for here was a piece of primitive bog land which Mr. Muschamp at once assured us produced *C. tiphon*, a fact which we proved accurate on our return, for we captured it here, as also *Hydrocampa nymphaeata* not observed on the larger bog. Near here, also, a ♂ *Polyommatus hylas*, with large spots on the underside of the forewings, was captured; however, we went on some little distance further, and soon a much larger hollow came in sight, a typical haunt for our quarry. The wood sloped down to the edge of the wide, alluring, rough, meadow-like stretch, which extended away to the left for at least a mile or more, as far as we could see, and, slowly uprising in front, changed gradually about 300 or 400 yards in advance of the wood into meadows and orchards which stretched for miles over the hills beyond. In the centre of the hollow, little pools glistened in the sun, and appeared to be partly choked with a mass of rank vegetation, rarely to be seen. The general surface of the hollow was a deep, rusty red, due to the tall waving heads of a grass or sedge that grew in great abundance everywhere, whilst above this, here, there, and everywhere, taller reeds were conspicuous. Letting ourselves down a small embankment, we were soon at work, for on this grew a pink *Ononis*, from which *Marasmarcha lunaedactyla* was disturbed, and almost directly after an example of *Oxyptilus pilosellae*, and two or three *Merrifieldia triadactyla* (*tetradactyla*). Reaching the bottom we were soon knee-deep among carices, scabious, tall, large, red-flowered *Centaureae*, a large yellow-flowered *Lotus*, bog-asphodel, *Gentiana pneumonanthe*, etc., and *Coenonympha pamphilus* was disturbed; but a little further on, the little white waving heads of *Eriophorum* showed thickly on a spongy piece of ground, and the large *pamphilus*-looking insect in the net proved to be *C. tiphon*; another and another followed, but many more were turned out of the net, as

being too worn, than were kept, and soon we had to pick our steps as the ground began to give beneath us, and we saw the pools covered with the white blossoms of the water-lilies. Edging towards the wood where the ground was firmer, we soon lost all but a stray *C. tiphon*, but swarms of *Epinephela janira* and *Enodia hyperanthus* were put up at every step, the last-named particularly abundant. One of the most abundant species here was *Ematurga atomaria*, a fairly large and interesting form; equally abundant was *Eubolia mensuraria*, and occasionally one flushed *Acidalia immutata* in first-class condition. Occasional specimens of *Argynnis aglaia* flew across the bog or settled on the flowers, and *Melitaea dictynna* was not uncommon, but altogether over. The two *Anthroceras* noticed in the wood were more abundant, and some of the *A. trifolii* had almost the facies of *A. palustris*, the lowland marsh species, whilst the six-spotted species, which so much resembles *A. filipendulae*, and may be *A. stephensi* (*hippocrepidis*, Stphs.), must have the genitalia examined to make certain of the species. The *A. trifolii* are especially interesting, a few examples with a faint red abdominal ring=ab. *rufincta*, and other interesting examples, but we obtained too few, and most of these in poor condition, to write really critical notes thereon. Two or three *Adscita statice* were also captured, but the species was going over.

(To be continued).

Notes on the Life-History of *Nepticula acetosæ*, Stt. (with plate).

By ALFRED SICH, F.E.S.

On August 15th, 1908, I was walking over the short turf in Richmond Park, quite away from any trees, when I accidentally came on a colony of *Nepticula acetosæ*. They were in all stages from the ovum to the full-grown larva, and the opportunity thus afforded of making some notes on the larval habits seemed too good to be thrown away. A supply of ova and larvæ was gathered, and some imagines were bred at the end of August.

A second supply of ova was taken, September 7th, in the same locality. It will be remembered that this species is the smallest British moth, and that Mr. Shield first discovered the insect in October, 1852, near Dublin. Since that time it has occurred in several places both here and on the continent. We have, in Britain, two species of dock, which are known by the name of sorrel, *Rumex acetosa*, L., the sorrel, and *Rumex acetosella*, L., the sheep-sorrel. They appear to be very closely allied, and *Nepticula acetosæ* attacks both species. The mines in both sorrels are similar, except that very often the narrowness of the leaf of *R. acetosella* compels the larva to make the first part of the mine oblong rather than circular in contour. Stainton (*Nat. His. Tin.*, i., p. 236) lays some stress on the fact that the food-plant of this *Nepticula* is *Rumex acetosa*, but, later, Tutt (*Brit. Lep.*, i., p. 53) gives the food-plant as *R. acetosella*. Both authors are right, as the larva feeds in either species of sorrel, but if there be any preference in the matter, then I think it lies with *R. acetosa*. From the great difference in the leaves of the larger docks, such as *R. obtusifolius*, *R. sanguineus*, etc., compared with those of the smaller sorrels, it seems unlikely that *N. acetosæ* would mine in them, but Stainton says (*loc.cit.*, p. 230) that Wing did find mines in a leaf of dock, though he does not mention

which species of dock. It is, however, clear that he meant one of the larger species.

The ovum.—The comparatively very large egg is laid almost always on the underside of the leaf and usually away from the midrib and from the margin. Several eggs may be laid on the same leaf, but always separately. The largest number I have seen is twenty, on a leaf of *R. acetosa*. There were twelve on one side of the midrib and eight on the other, all laid on the underside. On another leaf there were nine eggs, seven of which were laid on the upperside, which is however, quite the exception. Before being laid, I imagine, the egg is ovoid. The shell is evidently very soft, as after the egg is laid it is found to be very wide and flat, as though it had been poured on to the leaf in a molten state. It takes the exact impression of that portion of the leaf on which it lies. This causes its outline to become very irregular and often much indented, and also greatly adds to the difficulty of detecting the micropyle, a feat I have not yet accomplished. If one could persuade the moth to lay on glass, the micropyle could, no doubt, be made out. In outline, the egg is ovoid, or even sub-triangular rather than circular. There is a long axis which measures 0.38mm., and a shorter measuring 0.27mm. Of course the ova vary a little in size, but the smallest measured 0.32mm. by 0.23mm. They are very flat but vary in height, and I think 0.06mm. would about give the average height. There is no visible sculpture on the surface of the shell. When newly-laid the ova are colourless and transparent, but as the larva advances in growth its yellow colour shows through the shell, generally first appearing as a yellow line, running partly round the boundaries of the egg. A certain time before hatching, the larva can be seen lying in a curved position within the egg. The head is partly buried under the last portion of the abdomen, and there is an orange-coloured streak in the centre of the alimentary canal. Just before hatching the orange streak becomes concentrated, and, while the larva is eating its way into the leaf, it travels up to the anus and is eventually expelled. When the larva of *Phyllocnistis suffusella* eats its way out of the egg-shell into the leaf, its action is very vigorous, and within two hours it will be hidden in the leaf. *Nepticula acetosæ* is a great contrast with this, as its movements, when eating its way through the base of the egg-shell into the leaf, are exceedingly gentle. It has, however, much harder work to do than the other, which simply severs the cuticle of the leaf from the upper cells of the parenchyma, while the Nepticulid tunnels into the parenchyma and consumes the more solid portion, as well as the juice. One larva, which I noted more particularly, began to penetrate the leaf at 4.20 p.m. By 6.20 p.m. it had worked about half its head into the leaf. At 10 p.m. it had nearly withdrawn the thorax from the egg-shell. When I again saw it, the next morning, it had already left the egg-shell, and at 1 p.m. it was lying just under the upper cuticle of the leaf. At the least, the larva requires twelve hours to get clear of the egg-shell. On examining the forsaken shell we see that, where the larval head lay, there is a semi-circular hole in the cuticle of the leaf and a line of excrement, this running round the shell where the body of the larva lay, and ending in a little patch of orange. The egg-shell remains for weeks attached to the leaf, and may be noted as a silvery-grey flat speck in the centre of the circular part of even quite old mines. Under a lens it appears much

wrinkled, and will always serve to indicate the origin of any disturbance caused by *N. acetosae* in sorrel leaves, even if the discoloration of the leaf be not more than 1mm. in diameter.

The larval habits.—When leaving the egg the larva does not mine directly to the upper-surface of the leaf, but works its way through the parenchyma in a gradually ascending curve, completing perhaps two-thirds of a circle before reaching the upper cuticle. After once reaching the upper cuticle the larva continues mining just beneath it until full-fed, when, like most other Nepticulids, it quits the mine to pupate. Throughout the four stadia which it passes in the mine, it always mines venter uppermost. When the larva in the first instar reaches the upper surface of the leaf it continues the mine in ever-widening circles, and, having made two circles or two-and-a-half, it lies up for its first ecdysis. The mined patch at this stage measures $1\frac{1}{4}$ mm. in diameter, and is usually red, except where the two very irregular circles of fine black excrement lie. The gallery of the mine itself is rather wide in comparison with the larva, of a pale grey colour, with an irregular, often interrupted, line of black excrement, which lies sometimes in the centre of the gallery, and sometimes along one of the sides. The length of the gallery mined during the first stadium is about 4mm. The larva is exceedingly delicate, and it requires some care when extracting it from the mine. It is pale ochreous, with a somewhat swollen thorax, in which the small head is almost buried. It is quite helpless when out of the mine. The duration of the first stadium in some cases I noted as four-and-a-half days, but no doubt in warm weather this time would be much shortened, as the larva I took from the mine when seven days old was already in the third instar. As with many of these minute larvæ, the change of skin takes place rapidly, especially in the earlier stages. One example in the first instar had been feeding well certainly on the morning of September 17th, but, at midnight it was lying up for the change, and when I saw it again about 1 p.m. on the 18th, it was feeding vigorously, having in the meantime cast off its skin. The larva in the second instar is bright yellow, though when newly-changed it still shows the colour of the first instar. It reaches to the length of 1.2mm. Its mode of life continues the same, and the mine does not alter in character, though it is a little wider, and the black excremental track more distinct. I have no notes as to the duration of either the second or the third stadium, but if we find a mine about 2mm. in diameter, and especially if it has one pale half-circle outside the red blotch, we may safely conclude that the larva inside is in the third instar. When taken from the mine it is almost as helpless as in the first instar, bright yellow in colour, and about $1\frac{3}{4}$ mm. in length. It differs chiefly from the second instar in size, and the body is more cylindrical, whilst the 9th and 10th abdominal segments are longer and narrower in proportion, thus approaching the appearance of these segments in the last instar.

Its method of feeding is much the same, but it eats out the parenchyma to a greater depth, especially shortly before lying up for the last larval change. This is seen by the last half or three-quarters of the circle in the blotch-like part of the mine being nearly as transparent as the later serpentine portion of the mine. While still in the first rather narrow pale circle the larva usually lies up for the third moult. In the first three instars *Nepticula acetosae* exhibits a delicate,

inactive larva without locomotive organs, for the thoracic pads do not seem capable of progressive action when the larva is out of the mine. There are no visible setæ, and the only movements the body seems capable of, are lateral, the head and thorax can be moved from side to side, at least in the third instar. In the fourth (and last) instar, however, instead of the helpless larva, we find quite an active little caterpillar, provided with its due quota of setæ and a number of leg-like organs, by which it can make fairly rapid progress, and, besides this, it is endowed with a set of muscles which enables it to accomplish at least one gymnastic feat. This great difference between the third and fourth instars probably accounts for the longer period of time occupied during the third ecdysis, which, in some cases, lasted over 24 hours, and though I have no precise note on this point, I think the period is generally longer. Owing to the very thick cell walls of the sorrel leaf it is difficult, if not impossible, to observe the larva changing its skin, but I imagine it is like other Nepticulids in this respect and pushes the old head aside, then continues feeding till it is out of the old skin. On three occasions when I took larvæ in the fourth instar out of the mines, I found the head of the third instar adhering to the 8th or 9th abdominal segment. The larvæ, probably, in their progress, had brushed the old head along with them. By the way, by the above remarks I do not mean to say that the larva, even after having assumed the fourth instar some hours, is capable of the activity I mention, for this is gradually developed as the larva comes to maturity. Having entered on the fourth stadium, the larva usually mines one circle round its home before, as Stainton says, "it flies off at a tangent into an irregular tortuous gallery" (*Ins. Brit. Tin.*, p. 303). The gallery is now greenish, or sometimes pinkish-white, about 1mm. in width, with a rather thick, irregular, and often interrupted, line of dark excrement, sometimes running down the centre and sometimes down the side of the gallery. The course of this part of the mine is somewhat dependent on the leaf in which it is situated. If there be ample space, the larva will make two or three rather sharp turns in the leaf, above the earlier part of the mine, that is, towards the apex of the leaf, and then one bold sweep before the end. If, on the contrary, the leaf be very narrow or much occupied by other mines of *N. acetosæ*, the larva has to feed where it can find a vacant space, and the mine in consequence becomes very irregular. In one much eaten leaf, now before me, the larva has made two turns above the red part of the mine and then gone as closely as possible along the margin of the leaf, right round the apex to the opposite side, without making any deviation at all. More often the larva has to work its way with many turnings in order to avoid those parts of the leaf already eaten or occupied by its companions in the same leaf. I may say here that the larvæ seem to be of a remarkably gentle disposition, as in crowded leaves I have noticed them running side by side for some distance, in practically the same mine, without showing any signs of hostility, just as we sometimes see the larvæ of *Chrysopora hermannella* mining in couples in the leaves of *Chenopodium*. I have never attempted to ascertain the sexes of individuals thus running in double harness. To return to that portion of the mine made after the larva breaks away from the blotch-like part, though fairly even in width it is variable in length, depending possibly mainly on the nourishment afforded by the

particular leaf, or condition of the leaf, in which the mine is situated. In one case where the larva was free to continue in circles round the earlier mine the tangential portion, if one may for distinction sake so term it, was only 7mm. long, but the same portion of a mine in a leaf rather crowded with mines, measured 19mm. The larva in the fourth instar, when seen in the mine, appears of a beautiful yellow, with a broad green stripe running down the centre of the body. When viewed under a strong lens it has a peculiar appearance. The larvæ of most species of the genus *Nepticula* can be plainly seen in their respective mines, but not so that of *N. acetosae*. Owing to the very strong cell walls of the cuticle of the sorrel leaves the outline of the larva can only be guessed at, though its colours are plainly visible. It reminds one of a beautiful yellow and green stained-glass window. When fullfed the larva, sometimes at once, but more often, I think, after some delay, bites a semi-circular slit through the upper cuticle of the leaf and works its way out of the mine. The larva mines venter uppermost, and, therefore, comes out on its back. When nearly free of the mine it throws its head over its back, and, thus rolled almost in a ring, falls to the ground among the herbage.

(To be concluded.)

The Genius *Apion*; Notes from Sussex.

By HERWARD C. DOLLMAN, F.E.S.

The varied and profuse flora of Ditchling, and surrounding downland, induced me this August to give my attention to the Apions. The result has, I think, repaid the investigation, close upon fifty species having been captured. Some of the records are of particular interest, inasmuch as they refer to unusual foodplants.

The "subulate group" proved to be but poorly represented, perhaps August is late for such species as *Apion subulatum* and *A. craccæ*. *A. pomonæ* occurred sparingly on *Lathyrus*. Three species of the "squamosæ" group were taken, the common *A. ulicis* on *Ulex*, *A. genistæ* locally common on both of the species of *Genista*, and the recently-introduced *A. kiesenwetteri* also on *Genista*. The latter species was only found on Ditchling Common, and, although it was not rare, yet good examples were few and far between, as the insect is very soon abraded. For the detection of *A. kiesenwetteri* in the field, I owe my thanks entirely to Mr. H. St. J. Donisthorpe. *A. urticarium* was swept in small numbers off *Urtica dioica* at Alfriston; it was very local indeed.

Most of the yellow-red-legged species were to the fore, *A. rufirostre*, *A. riciae*, *A. difforme* (two examples taken off *Hypericum quadrangulum*), and *A. varipes* were common. I took some sixteen examples of the latter species off *Lathyrus pratensis*, a pabulum not recorded for it before. *A. apricans*, *A. trifolii*, *A. bohemani*, *A. dichroum*, and *A. nigritarse* were all common.

By sweeping *Matricaria*, both *A. confluens* and *A. hookeri* were freely taken, the latter often in very great abundance. *A. acneum*, *A. radiolus*, *A. carduorum*, and *A. onopordi*, of course proved themselves not to be rarities; I found *A. onopordi* not uncommonly on *Arctium lappa*. Working thyme yielded *A. ricinum* (very rare), and also *A. atomarium*; this little *Apion* was very prolific. *A. virens* and *A. pisi*

were both common; *A. punctigerum* and *A. aethiops* very local, but common, were found. From *Lotus major* the very distinct *A. ebenium* was taken freely; also more rarely off *L. corniculatus*. *A. filirostre* was common on *Medicago lupulina*; wherever the medick grew it seemed to harbour the beetle. *A. striatum*, *A. ononis*, *A. erri*, and *A. spencei* were all common; *A. vorax* was decidedly rare, only two specimens being taken. *A. unicolor* and *A. gyllenhali* were both common on *Vicia cracca*; this southern record for *A. gyllenhali* is interesting. Sweeping melilot produced *A. meliloti*; the plant is common in numerous places around Ditchling, but the beetle is singularly restricted in its distribution. *A. scutellare*, *A. liverscerum*, *A. loti*, *A. seniculum*, and *A. tenue* were all found on their customary foodplants; *A. liverscerum* was very scarce, only about half-a-dozen to a field of sainfoin. *A. pubescens* was rare; a few examples taken by sweeping long grass. *A. marchicum*, *A. violaceum*, *A. hydrolapathi*, and *A. humile* were frequently taken; *A. marchicum* seems to like chalk downs as much as "sandy places." Although many of the above-mentioned records are of common, or moderately common, species, I yet think this note justified on the score of quantity alone (if not on that of quality) of the species mentioned.

Glands of Pierid Larvæ.

By J. W. HARRISON, B.Sc.

I have been rearing large broods of *Pieris rapae* and *Pieris mannii* larvæ. In handling them I noted that they often threw back their heads in a manner suggestive of *Odontesia camelina*. As I had lately discovered that *O. camelina* did this in order to throw out eversible glands similar to those found in *Cerura vinula*, I thought that this act of the *Pieris* might be for a similar reason, and I was not disappointed for I was successful in seeing the glands protruded in a full-grown larva of *P. mannii*.

The glands are protruded from the underside of the neck. They are greatly different from those seen in *Odontesia camelina*, *Notodonta siccae*, etc., for these bifurcate glands take their origin in a single transverse slit. On the contrary the glands in *P. mannii*, when not protruded, are visible externally as two small sucker-like marks, one on each side of the neck. The glands themselves, instead of being forked, like those of the Notodontids, are globular, and, as noted before, are not connected at the base. In appearance they remind one of a gooseberry, or, better still, a seed of *Galium aparine*. They are green in colour and rugged. This ruggedness is caused by the large number of minute points which cover them. Although described as globular they are slightly curved inward and downward at the tips. In size they have a diameter equal to half the breadth of the neck. I could detect no liquid or scent thrown out, but it does not follow that no scent was produced, for the senses of insects are not those of human beings.

[Mr. Harrison has struck here a very interesting line of observation. The glands are the well-known "chin-glands" of Buckler, Chapman, etc. Some years ago we dealt with these peculiar eversible glands (*Nat. Hist. Brit. Lep.*, i., p. 34; viii., pp. 18, 22) and pointed out, among other details, the peculiar fact that they seemed to be confined to the super-families of our Noctuo-Papilionid stirps. They are common to

Lymantriids, Noctuids, Notodontids, and Papilionids, *i.e.*, to the upright-egged superfamilies of the lepidoptera. Although there are many observations on these peculiar structures, the differences in detail in the various superfamilies have not yet been at all satisfactorily worked out. That they are remnants of offensive or defensive structures appears certain.—ED.]

Lepidopterological Notes in 1908.

By CECIL FLOERSHEIM, B.A., F.E.S.

SPRING LEPIDOPTERA AT NERVI.—At Nervi, a few miles east of Genoa, I noticed the following species of Rhopalocera during four days spent there in the May of the present year. *Iphiclides podalirius* on the wing and ovipositing May 22nd. *Papilio machaon* larva on fennel, second instar, May 20th. *Pyrameis atalanta* imagines abundant and in perfect condition, May 20th and 23rd. *Pieris brassicae*, full-grown larva, May 24th.

LARVAL HABIT OF NEMEOBIUS LUCINA.—The larva of *Nemeobius lucina*, anyhow in its later stages, seems to feed entirely by night, and hides amongst the withered leaves of primrose, with which its colour harmonizes exactly by day.

PUPATION-POSITION OF GONEPTERYX RHAMNI.—The few pupæ of *Gonepteryx rhamni*, which I succeeded in finding on *Rhamnus frangula* this year, were all attached to the mid-rib of the undersides of a leaf, with their heads pointing towards the stem.

BUTTERFLY ATTACKED BY BIRD.—In June of the present year I was carrying a specimen of *Euphœades troilus* ♂ to my butterfly-house, when it escaped and settled on some espalier pears close by. As I was hurrying to capture it, a hen blackbird, who had a nest near at hand, swooped down upon it and carried it off, still fluttering, to her young with a cluck of triumph. I thought this might be of interest, in view of the rare occasion upon which birds are seen to attack butterflies in this country.

PAIRING HABIT OF DRYAS PAPHIA.—*Dryas paphia* pairs after a short courtship on the wing, the female then settling on some bush and fanning her expanded wings in the sunshine, copulation taking place *in situ* without further flight. Other males often attempt to pair with the already mated female whilst *in copula*, upon which the couple already paired fly off, with the male dependent, as I have observed in *Epinephele janira* and other *Satyrinae*. The female often keeps her wings expanded to the sunshine whilst *in copula*, but I have not observed the male doing so. Pairing generally happens between half-past eight and half-past eleven on fine mornings, separation taking place during the afternoon. From the number of butterflies I observed *in copula* in my house, many of which were worn ones, I should say that the female of *Dryas paphia* probably pairs more than once; I will try to ascertain this for certain next year.

OVIPOSITION OF DRYAS PAPHIA.—*Dryas paphia* begins to lay its eggs from about a fortnight to three weeks after emergence. I watched the females this year depositing their ova on or about the following: crevices in the trunk of a willow tree, wintered flower-heads of spur-valerian, upper- and undersurface of leaves of *Aristolochia sipho*, leno of sides of butterfly-house, faded flowers of pansy, and even on pansies and violets, the foodplants themselves. Several times the female I was

observing laid an egg on my coat or trousers, evidently liking the warmth of the sun-warmed flannel. In fact, she seemed willing to oviposit on anything within a few feet of the larval pabulum. I removed what ova I could collect and some pansies to a small cage out-of-doors, in the hope of being able to observe the habits of the resulting larvæ. But in this I was unsuccessful, as some Carabid beetles got in and must have devoured most of the young larvæ before long. Anyhow, I was only able to find one, and that almost half-grown, on September 7th, hiding at the root of a plant of cultivated pansy. This, however, in view of the unusually cold last half of August and early September, may prove of interest.

ATTEMPTED PAIRING OF SIMILAR-LOOKING SPECIES.—In view of it having been suggested that butterflies, owing to their limited vision, can only see masses of colour, the following may prove of interest. On June 17th, this year, as a freshly-emerged ♀ of *Heracles cressphontes* was expanding her wings on a small tree in my butterfly-house, a ♂ *Papilio machaon* flew up and attempted to copulate with her. In fact, he so far succeeded that the two remained seemingly joined for quite a minute, after which he flew off. On the same afternoon I saw a ♂ *Laertias philenor* make a desperate attempt to pair with a ♀ *Euphœades troilus*, only giving up after a courtship of several minutes. Now these butterflies are widely separate among the Papilionids, yet, in both cases, the pattern of the females' wings bore a strong resemblance to that of the proper female of the male who sought to pair. Indeed, I have never noticed an attempted pairing between different species of butterfly, unless of extremely close relationship, such as *Papilio machaon* and *Papilio asterias*, unless the colour and wing-pattern resembled closely those of the species of the male. Though I have often had male *P. machaon* and female *Jasonides glaucus* out together, I have never seen the *machaon* attempt to pair with the *glaucus* (*turnus*), which, though it is more closely allied to *P. machaon* than is *Heracles cressphontes* in many ways, and is of the same colour, has a striped pattern, instead of one resembling that of *machaon*. Of course, this may only be an accident.

Olophrum assimile, Pk., an Addition to the British List.

By Prof. T. HUDSON BEARE, F.E.S., and H. St. J. K. DONISTHORPE, F.E.S.

We have pleasure in announcing the capture of a considerable number of specimens of *Olophrum assimile*, Pk., which is new to our list, in flood-refuse on the banks of the river Spey, near Nethy Bridge, during the second and third weeks of September last. This species was described by Paykull in "Fauna Suecica," iii., p. 409, and the following is a rough translation of the description given in Ganglbauer ("Die Käfer von Mitteleuropa," vol. ii., p. 720):—Colour, testaceous-brown, the underside of the body and the abdomen being a darker brown, somewhat shiny; head somewhat strongly and thickly punctured, terminal joint of the antennæ finely pointed; the thorax about half as broad again as long, rounded at the sides, with bluntly rounded basal angles, somewhat deeply and thickly punctured on the disc, with flattish side borders, which have a small pit near the middle. The elytra are more than half as long again as the thorax, about as thickly punctured, but the punctures are rather deeper. Length $3\frac{1}{2}$ -4mm. It

appears to be very widely distributed throughout Europe, though Ganglbauer states that it is rare. Fauvel ("Faune Gallo-Rhenane," vol. i., p. 98) in describing this species says rightly enough that it has the facies of *Lathrimaeum unicolor*, and, according to him, the localities in which it has been taken are spread all over Europe. It may be worth while appending Ganglbauer's table for separating the European species of *Olophrum*.

TABLE OF SPECIES OF OLOPHRUM.

1. Sides of the thorax, only rounded close to the anterior angle	2.
Sides of the thorax cut away obliquely at the anterior angles, body somewhat elongate.. ..	ROTUNDICOLLE, Sahlb.
2. Sides of thorax completely rounded, body short and broad	3.
Sides of thorax sinuate behind the middle, body somewhat elongate	ALPINUM, Heer ; CONSIMILE, Gyll. PICEUM, Gyll ; FUSCUM, Grav.
3. Basal angles of the thorax completely rounded	
Basal angles of the thorax bluntly angled, and only rounded at the point	PUNCTICOLLE, Epp. ; ASSIMILE, Pk.

Four of the above species have now been found in Great Britain; of the others *puncticolle* appears to be confined to south-east Europe, and is therefore unlikely to occur in our country, but *alpinum*, which has been taken in the Alps and Pyrenees, and *rotundicolle*, which occurs in Lapland and Finland, might probably be found in the northern parts of Scotland.

It is worth while pointing out that Ganglbauer says *consimile* occurs on the shores of the Baltic, so there is no reason why it should only occur in this country on mountains. *Alpinum* is very like it, being somewhat more convex and more coarsely punctured. The shape of the thorax at once separates *rotundicolle*.

Assimile appears to be found on the Continent in moss, and, under dead leaves in woods, and from its distribution should occur in England. Owing to the heavy rainfall over north-east Scotland in the early days of September, the Spey was in high flood for a couple of days, the refuse we worked was strewn along the river-banks for miles, and was crowded with beetles during the first few days after the river had subsided to its normal level.

Cyanide Killing-bottles.

Several recipes have been given in entomological journals, and in Mr. Tutt's excellent *Practical Hints*, for making "cyanide killing-bottles." The method which we have found the best and the most durable, has not apparently been adopted to any extent. It may, therefore, be of some use to other entomologists to explain it, and the chemical reasons why this type of killing-bottle is to be preferred. Killing-bottles made according to the usual methods have but a short life, and generally moisture forms on the surface of the plaster at the bottom of the bottle. The action of a cyanide killing-bottle, depends on the liberation of hydrocyanic acid gas from the potassium cyanide by the carbon dioxide and water of the atmosphere, the end of the chemical action being expressed thus: $2 \text{ KCN} + \text{CO}_2 + \text{H}_2\text{O} = 2 \text{ HCN} + \text{K}_2\text{CO}_3$. The carbonate of potash thus formed is hygroscopic, and deliquesces with the water of the atmosphere. It

is this solution of carbonate of potash which frequently forms on the surface of the plaster in killing-bottles. If the cyanide of potassium is first embedded in dry plaster and covered by it, and the whole then covered by a thin layer of wet plaster to keep it in its place, the deliquescent carbonate of potash is absorbed as it is formed, and a very durable killing-bottle is made. A very little tartaric acid powder can be mixed with the dry plaster if a very strong bottle is required.

Cyanide killing-bottles do not act in the desert or other very dry places, because the tension of the aqueous vapour in the air is less than the tension of the vapour of a saturated solution of cyanide of potassium at the same temperature. Under these circumstances, the strength of the bottle can be restored by dropping a few drops of vinegar, or of a dilute solution of tartaric acid, or some "soda-water into it."—N.C.R.

Synopsis of the Orthoptera of Western Europe.

By MALCOLM BURR, B.A., F.L.S., F.E.S., F.Z.S., etc.

(Continued from p. 200.)

4. PYCNOGASTER SANCHEZ-GOMEZI, Bolivar.

Closely allied to the preceding, and, like it, without spines on the posterior tibiae, but the pronotum is somewhat different, the spines of the posterior femora are stouter, and the cerci of the ♂ have the inner tooth further from the apex, which is conical, and somewhat prolonged; the supra-anal plate of the ♂ is very long and narrow.

Recorded from Velez Rubio in Almeria.

5. PYCNOGASTER CUCULLATUS, Charpentier.

Distinguished by the rectangular emargination of the hinder border of the pronotum; the ovipositor is curved, and the infra-anal plate of the ♂ rounded behind. It is a doubtful species, described by Charpentier and Fischer, whose description Brunner copied; Bolivar refers here, with some doubt, specimens from Toledo. Length of the body, 27mm. ♂ and ♀: of pronotum, 9mm. ♂ and ♀; of ovipositor, 27mm. ♀.

Recorded by Charpentier from Portugal, and with some doubt from Toledo by Bolivar.

6. PYCNOGASTER BOLIVARI, Brunner.

Distinguished from *P. cucullatus* by the metallic sheen, and the coloration of the abdomen, by the nearly straight ovipositor, and the slightly emarginate subgenital lamina of the ♀; from *P. jugicola* by the brighter green colour, and nearly straight side keels of the pronotum. Length of body, 36mm. ♂, 38mm. ♀; of pronotum, 12mm. ♂, 13mm. ♀; of posterior femora, 17mm. ♂, 18mm. ♀; of ovipositor, 38mm. ♀.

Recorded by Brunner from the Sierra de Peñalara, and by Bolivar from Fuencebado, in the Province of Leon.

Navas considers it identical with *P. jugicola*.

7. PYCNOGASTER BREVIPES, Navas.

Resembles *P. bolivari*, but darker in colour, and much more shining, shorter and thicker feet, and much shorter ovipositor. Length of body, 38mm. ♂, 42mm. ♀; of pronotum, 10mm. ♂, 11mm. ♀; of posterior femora, 13mm.-14.5mm. ♂, 15.5mm. ♀; of ovipositor 27mm. ♀.

Recorded by Father Navas from Monte Cauno in Aragon, on juniper.

PYCNOGASTER JUGICOLA, Graells.

Distinguished by the bent keels of the pronotum, so that the disc is one-third narrower posteriorly than anteriorly. Length of body, 36mm. ♂, 38mm. ♀; of pronotum, 12mm. ♂, 13mm. ♀; of posterior femora, 17mm. ♂, 18mm. ♀; of ovipositor, 38mm. ♀.

A native of the Sierra de Guadarrama.

Family VI: *SAGIDÆ*.

This family contains a few genera of large and active carnivorous grasshoppers, occurring sporadically in most regions of the Old World. In Europe but few species are known, representing the single genus *Saga*, and only two of them have been recorded in Western Europe. These are very large, heavy, clumsy insects, strongly armoured with numerous spines, and with abortive organs of flight. In some species the males are excessively rare, while the females are fairly common. They may be found singly, resting on high grass and scrub, surveying the surrounding country in open, dry, hot places in southern Europe. They are fierce and carnivorous, and are, in fact, the lions and tigers of the insect world. They have very powerful jaws, which are capable of giving a bite which is severe even to human beings. They are also accused of cannibalistic tendencies.

Genus: *SAGA*, Charp.

Very large, elongated, green insects, with rudimentary organs of flight, long, spiny legs, and a long sword-like ovipositor in the females.

TABLE OF SPECIES.

- | | |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|
| 1. Elytra in ♂ not attaining middle of metanotum, with no raised edge: ovipositor three times as large as pronotum: pleuræ and sides of abdomen with white bands | 1. <i>SERRATA</i> , Fab. |
| 1.1. Elytra in ♂ much longer than metanotum, with a vertical, laminated, raised edge: ovipositor two-and-half times longer than pronotum: pleuræ and sides of abdomen with black and white bands .. | 2. <i>VITTATA</i> , F. de W. |

1. *SAGA SERRATA*, Fabr.

Easy to recognise from all but its near allies, by its form and size, and the characteristics of the family. Its relatives are rare in Europe. Length of body, 60mm. ♂, 61mm.-67mm. ♀; of pronotum, 11.5mm. ♂, 11.5mm.-12mm. ♀; of elytra, 4.5mm. ♂, 0mm. ♀; of ovipositor, 34mm.-36mm. ♀.

The male is excessively rare, as only two or three specimens are known to exist in collections. The female occurs singly, but not uncommonly, throughout southern Europe. In France it is relatively rare, but is recorded from Cette, Agde, Vias, Hyères, Forest of Esterel, near Cannes, Saint Tropez, Ramatuel, Roquebrune, Cavalaire, Saint Marcel, Nîmes, Bagnols, Clos Oswald, Cogolin, and a male is recorded from Sainte Baume. In Spain, at Uclès, Serrania de Cuenca, Talavera de la Reina, Escorial, and Madrid. In Italy it seems to be rare, but certainly occurs in the north at Voltaggio. The most northern-recorded locality is Kahlenberg, near Vienna, but in Austria it is known also from Leopoldsberg, Otterberg, Bisamberg, Klosterneuburg, Voslau, Kalenderberg, Eichkogel, Mödling, Anninger, Gaisberg, Baden, Giesshübl, Brück and Znaim.

2. SAGA VITTATA, F. de W.

Differs from *S. serrata* as shown in the table. Length of body, 55mm.-65mm. ♂, 65mm.-70mm. ♀; of pronotum, 10mm.-14mm. ♂, 12mm.-13mm. ♀; of elytra, 10mm.-11mm. ♂, 0mm. ♀; of ovipositor, 33mm.-34mm. ♀.

A Levantine and Balkan species, which has been recorded by Costa from Otranto in Italy.

Family VII: STENOPELMATIDÆ.

This family is readily distinguished by the compressed tarsi: it contains a number of spidery, apterous (in European genera) brownish grasshoppers, which live in caves and holes. Two genera occur in Europe, but owing to the isolation of their habitats, the species are rather minutely subdivided, and their discrimination correspondingly subtle.

TABLE OF GENERA.

- | | |
|---------------------------------------------------------------------------------------------------------------------------------|----------------------|
| 1. Hinder tibiæ with very numerous minute spinules above, and a few larger ones; furrowed beneath, with numerous spines | 1. TROGLOPHILUS, Kr. |
| 1.1. Hinder tibiæ with equal spines above, not very close together; smooth beneath, with few spines. .. | 2. DOLICHOPODA, Bol. |

Genus I: TROGLOPHILUS, Krauss.

Of this genus a single species occurs in West Central Europe.

1. TROGLOPHILUS CAVICOLUS, Kollar.

Yellowish-testaceous, unicolorous, or varied with fuscous: anal segment of male, with rounded lobes of female, gently emarginate. Length of body, 17mm.-20mm. ♂, 18mm.-21mm. ♀; of pronotum, 5mm. ♂ and ♀; of posterior femora, 16mm.-18mm. ♂, 17mm.-19mm. ♀; of ovipositor, 12mm.-13mm. ♀.

Occurs in limestone caves and shady woods, under stones and leaves in Austria, Graz, Klagenfurt, Schelmenloch near Baden (Vienna), and in Lower Austria at Hinterbrühl, near Gumpolds Kirchen, Soos, Gloggnitz, Kranichberg, and Meran.

Genus II: DOLICHOPODA, Bolivar.

The members of this genus are even more spidery than those of the preceding, but the general structure is very similar.

TABLE OF SPECIES.

- | | |
|---------------------------------------------------------|-----------------------|
| 1. Femora spiny beneath | 1. BORMANSI, Br. |
| 1.1. Femora not spiny beneath. | |
| 2. Knees with two little spines. | |
| 3. Anal segment of ♂ with two points, very large | 2. PALPATA, Sulz. |
| 3.3. Anal segment unarmed. | |
| 4. Abdominal segments bordered with brown | 3. GENICULATA, Costa. |
| 4.4. Abdominal segments not bordered with brown | 4. AZAMI, Sauley. |
| 2.2. Knees unarmed | 5. LINDERI, Duf. |

1. DOLICHOPODA BORMANSI, Brunner.

Distinguished by the presence of small spines beneath the anterior and middle femora: segments of thorax and abdomen bordered with dark: anal segment of male unarmed. Length of body, 16mm. ♂; of pronotum 4mm. ♂; of anterior femora, 14.5mm. ♂; of middle femora, 14mm. ♂; of posterior femora, ?.

Discovered by the late Auguste de Bormans in the Grotto Cisco, near Bastia, in Corsica. The female is unknown.

2. DOLICHOPODA PALPATA, Sulzer.

Pale yellowish-brown : unicolorous : all femora unarmed beneath. Length of body, 22mm. ♂, 20mm. ♀ ; of pronotum, 4mm. ♂ and ♀ ; of anterior femora, 16mm.-17mm. ♂ and ♀ ; of middle femora, 15mm.-16mm. ♂ and ♀ ; of hinder femora, 24mm.-25.5mm. ♂ and ♀ ; of hinder tibiæ, 30mm.-31mm. ♂ and ♀ ; of ovipositor 15mm. ♀ .

This very spider-like creature occurs in a few widely-scattered localities in caves in South Europe. It seems to be commonest in Dalmatia, but has been taken in the old aqueduct near Rome, and also at Espezel, and at Beluis near Quillau, in southern France.

DOLICHOPODA GENICULATA, Costa.

Azam distinguished this species from its congeners, as shown in the table of species, but Brunner fuses it with *D. linderi*, after a comparison of Dufour's type of *D. linderi*, and typical Italian specimens of Costa's species. There appears to be no difference in dimensions.

D. geniculata is recorded from Valdieri, Caramanico, and Soriano, in southern Italy.

Notes from the Pyrenees—*Odezia atrata* and its Variation (*with two plates.*)

(Concluded from p. 225.)

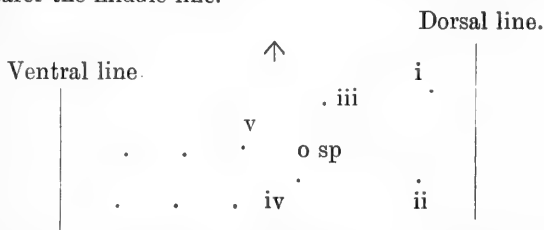
By T. A. CHAPMAN, M.D.

The young larvæ took at once to young leaves (which were just appearing) of *Conopodium denudatum* (we used to call this *Bunium flexuosum*, earth-nut, so it is not the zoologist only that makes a mess of well-known names). At rest they sit with the head curled under against the 4th or 5th abdominal segment. On April 5th the oldest larvæ were in the 3rd instar, some few still in the first.

First instar : The young larvæ are pale whitey-green, with a broad dark green band down each side, subdorsally, the head pale brownish-ochreous. When fullgrown, in first instar, the dorsal line is seen to be double, *i.e.*, with a very slender mediodorsal line dividing it into two pale lines.

Second instar : In the second instar it grows to 7mm. long. As in the first, it is long and slender, with the head and legs accumulated close to one end, the prolegs at the other. Each segment is slightly barrel-shaped. It curls the head beneath when resting after a little disturbance, and has a habit of vibrating to and fro, with curious effect when several are so employed at once. In the second instar there is still the pale (double) dorsal line and the darker subdorsal band, but there is a distinct breaking up into more numerous lines ; this dark band has two pale lines down it, and the paler lateral band has a dark broken line below the spiracle. The tubercles and (very short) hairs are black. They are i and iii on 2nd subsegment, near its front ; ii at back of 3rd subsegment, *i.e.*, if we recognise four about equal subsegments, but the 3rd has some traces of being really two, or perhaps three, but less well-marked than the others. Behind and below the spiracles, to the front of the 3rd subsegment is iv, and v well below the spiracle and a little in front of it. The spiracle itself is pale ochreous. The prothorax (pl. xx., fig. 4) shows a front and back row of four hairs, and a little further out, but above spiracle, a compound(2) tubercle, on an intermediate line. Across the meso- and metathorax is

a transverse row of six short hairs, then, in the same row, at each end, a longish hair, then a very short hair a little behind, and then another at a slightly lower level, but so far in front as to be on the subsegment in front of the others. These lines of hairs are on about the middle of segments, but the subsegmentation, if such, varies at different elevations, that is, the sulci are short, some dorsal, some lateral, so that to name subsegments is difficult, and would probably be wrong. The head is pale ochreous-green, marked with short streaks of a more olive tint. The 6th abdominal segment is short, the 7th and 8th very short, so that the widely-spaced tubercles of the forward abdominal segments are here crowded together (longitudinally). On the 9th are eight tubercles in line across the segment, the 10th has two dorsal and three marginal on each side. Ventrally is a central white line with a similar one on either side of it. The tubercles beneath are, below v, two about in line with it, and dividing equally the space to middle line. Well behind iv, three (on each side) in transverse line, each, as it were, corresponding with v and the two below it, but each rather nearer the middle line.



Third instar : In the third instar the larvæ reach 12mm. or 13mm. long. They divide into green and brown larvæ. The green have a broad green dorsum, with three whitish lines on either side and a very broad whitish lateral line. The brown ones are more variable; some are marked like the green ones, in brownish and ochreous, but some have dark dorsum broadening at middle of segments, or rather giving place to brownish at posterior border of segment, followed by two pale reddish-brown lines, then a nearly black fine line above the pale lateral line. There is also a fine black mediodorsal line. One is really richly-coloured, with eight lines on each side, viz., dark olive dorsal line, ochreous-olive, olive-green, pinkish, olive, pale pinkish-ochreous, black-brown, pale lateral. In one specimen all these lines are present, but the middle of the segment is much darker dorsally, and a similar darkening extends from this dorsal patch to either side, ending narrowly at the pale lateral band; in this specimen, each dorsal tubercle has a pale ring.

Fourth instar : On April 12th, 1908. A number are now in the fourth instar, though with still a good deal of growing to do. They divide themselves as to colour into a green and a brown set. The green ones are tolerably uniform—they have a darker dorsal line. The marginal flange is white. The green ones vary most in this white band, sometimes it is very white, at others it is almost green, though paler than the other portions. Its lower border is sharply defined, but it fades a little upwards into green, much like the white stripes in *Euchloe* and similar Pierid larvæ. From its lower margin to the dorsal line are six bands, an upper one, broad, of ground colour,

green, and the lower, the white band, these two of about equal width; the four between taken together make up about the same width, and are two pale lines, like the marginal band, but not white, as it has by here faded into greenish, and two darker like the subdorsal green. It is as though these lines were bits of the dark and white, moved apart into the area of the other. The anal plate is pale, with broad dark central line, bordered by a creamy, nearly white line. The clasper flaps green; head green, dappled with fine, darker, almost brown spots. The dark larvæ vary a good deal, and may be described as brown, olive, ochreous or some similar tint. As a matter of fact the effect is the result of a number of different tints, each of which varies from larva to larva. There are precisely the same lines as in the green larvæ. The dorsal line is dark, sometimes nearly black. The broad dark subdorsal band is ochreous or pink, marbled with dark brown, sometimes concentrated so as to give a dark diamond mark on each segment something like many *Téphroclystis*. The tubercle i is always conspicuous as a black dot in a pale circle, ii is similar, but requires looking for. The pale lateral band sometimes has a little white at its lower margin, but is for the most part ochreous, flesh-colour, or pink. The fine dark line immediately above it is generally nearly black, the next pale one pink, the second pale one ochreous, and the intermediate darker one of same tint as the broad dorsal one. Immediately below the pale lateral line, there is a very dark, sometimes nearly black, sublateral band, below which it is paler, with two pale ventral lines. In the green ones, the sublateral band is dark green, the double ventral line is also present. A very dark larva appears to be, broadly, almost black dorsally, with the dark area widening in each segment, varying through rich ochreous to nearly white at the margin, but with a lens, the lines above described are seen, but in addition one notes that each line varies a good deal in tone at each portion of each segment. The head is pale, with some fine dark lines and spots. The anal flap is a vivid pink (with central dark line) in most of the dark specimens. The larva still has two attitudes, stretched out and given to tremulous vibration, and curled round into rather more than a circle. At present the larvæ are about 18mm. long by 2mm. wide, fairly uniform in width, except the spread of the flap of the claspers. That a large proportion of the larvæ are dark and richly-coloured does not seem to have been observed, the descriptions given being seemingly all taken from Buckler, who only had green ones. His fed on the flowers of *Conopodium*. It is possible that those that continued on the leaves, on, or close to, the ground, are the dark ones. My larvæ had all pupated before flowers appeared, and naturally, I suppose, flower-heads are only available for full-grown larvæ. As to the foodplant, I saw the moth this summer swarming in Switzerland in meadows, where I could find no *Conopodium*, though other *Umbelliferae* were plentiful enough. It is not easy to convey by description the rich and varied colouring of some of these dark larvæ, producing a rather dull and earthy general effect, not unlike some of the darkest leaf-stalks of the *Conopodium*, and, perhaps, harmonising still better with the earth and dead leaves amongst which they grow. A census of the largest larvæ shows 28 green, 25 dark.

The larvæ, when quite full-fed, are about 21mm. long at rest, and 24mm. when stretched. On April 18th I note that they have been

"going down" for the last two or three days. On May 8th I further note the last larva has disappeared some few days since. The first moths, ♂ and ♀, appeared yesterday morning. To-day, 14 moths came out, 7 ♂, 7 ♀. They appeared between 7 a.m. and 8 a.m., none after 8 a.m. On the 9th, 14 moths emerged, all ♂ but one. I got six pairings. The moths rest with wings flat, but when paired, the ♀s sit with wings slightly raised, and the ♂s with the wings closed over the back, butterfly fashion. The moths paired about 10.30 a.m., and were still paired at 12.15; at 1.20. p.m. they were separated and a few eggs already laid. The moths paired almost immediately on an opportunity being afforded. May 10th, 4 ♂s emerged.

PUPA: The larvæ make slight cocoons amongst the rubbish on the surface, not below, unless the material is very loose. The pupa is about 10mm. to 11mm. long, of ordinary light brown tint, 3mm. at widest, opposite 4th abdominal segment, fairly circular in outline everywhere, but with sufficient of the extra thickness opposite the wings and appendages to be easily seen when looked for, as if they were added after the general smooth outline had been determined. The end of the 3rd tarsi project beyond the wings as a free process, over the 5th abdominal segment, for about 0.3mm. The wing-nervures are all very prominent and conspicuous, as somewhat sharp margins in which the hollows of the interneural spaces meet. Two prominent features are the cover of the prothoracic spiracle, which is a raised dark button, the margins being especially dark, due to one here seeing the under incurved margin behind the upper surface. They are slightly over 4mm. transversely to pupa, 3mm. longitudinally; they are covered with minute, smooth, rounded elevations, each carrying a fine hair; these elevations are ranged in rows (a little irregular), and are about 0.01mm. wide and 0.015mm. long, and are of the same size (approximately) as the skin-points of the inter-segmental membrane beside them and the fringe of fine hairs on the margin of the prothorax opposite them. These buttons are conspicuous enough to be easily seen, almost to attract attention, without a lens. The anal armature consists of two sharp spines, slightly diverging, each about 0.3mm. long. On neither the 9th nor 10th abdominal (two last) segments are any hooks or hairs of any sort. The dorsal margin of the 10th abdominal, or rather the suture between the 9th and 10th, has its margins dark and thickened, slightly crenate at the 9th, more extensively developed on the 10th, with a crenate or nodulated margin and a special deep recess medially. The small pits, so common on pupæ, are absent on the mesothorax and appendages, but on the prothorax there are, on either side, 17 or 18 along the front margin, and two of them, in defined positions, have a small transparent spot in each of them. On the metathorax and abdominal segments (except 9th and 10th) they are abundant. The hairs are (on one side) on the prothorax, four; on mesothorax, three, in a median transverse line; on the metathorax a similar three, with a fourth close to wing-base; on the 1st abdominal i and ii near front and back margins of segment respectively; on the 2nd and 3rd abdominal the same, with iii in front of spiracle. On the 4th abdominal iii is more above the spiracle, and there are two more hairs ventrally at posterior margin of segment. On the 5th abdominal segment these are present, and also a hair in

line with spiracle and a good way below it, a little ventral to the front of the two marginal hairs, and another behind and only a little below spiracle. The 6th and 7th abdominals are the same, as also the 8th, though the spiracle is cicatricial. The hairs are about 0.25mm. long, slender, smooth, and pointed. Further details would unduly extend this already lengthy description, but it ought, perhaps, to be noted that there is a (femora ?) piece between the maxilla and first leg, that there are two (antenna-basal) hairs on either side of the vertex and a pair at the base of the labrum.

EXPLANATION OF PLATE XIX.

Fig. 1.—Eggs of *Odezia atrata* $\times 10$ (A. E. Tonge).

Fig. 2.—Portion of eggshell of *O. atrata*, showing structure of shell wall, including the furrow of one side (expanded in mounting) $\times 140$ (F. N. Clark).

Fig. 3.—Micropylar area of egg of *O. atrata* $\times 350$ (F. N. Clark).

PLATE XX.

*Fig. 1.—*Odezia atrata* var. *pyrenaica* $\varphi \times 4$ (Photo. from life by Hugh Main).

Fig. 2.—Larva $\times 2$ (H. Main).

Fig. 3.—Four different views of pupa $\times 4$ (H. Main).

Fig. 4.—Prothorax and portion of mesothorax of pupa $\times 45$, showing button-like spiracle-cover (F. N. Clark).

Everes alcetas (coretas) as a distinct species from Everes argiades.

By J. W. TUTT, F.E.S.

(Concluded from p. 237.)

It becomes, therefore, interesting to have Reverdin's remarks on the two insects, as occurring in Switzerland; *alcetas* only seems to occur in the Valais. He also notes the difference in the shape and

Form.	No.	Sex.	Right wing.	Left wing.	No.	Sex.	Right wing.	Left wing.
<i>Argiades</i> (forewing) submedian line.	6	σ	7 dots	7 dots	8	φ	7 dots	7 dots
<i>Alcetas</i> (forewing)	8	σ	7 "	7 "	1	σ	3	5
submedian	12	σ	6 "	6 "	4	φ	7	7
line.	2	σ	6 "	7 "	1	φ	7	6
	1	σ	7 "	5 "	1	φ	4	5
	1	σ	5 "	6 "				
<i>Argiades</i> (hindwing)	3	σ	9 "	9 "	4	φ	9	9
submedian	1	σ	8 "	2 "	2	φ	8	8
line.	1	σ	7 "	5 "	2	φ	6	6
	1	σ	5 "	5 "	1	φ	5	5
<i>Alcetas</i> (hindwing)	9	σ	9 "	9 "	3	φ	9	9
submedian	1	σ	8 "	9 "	2	φ	8	9
line.	8	σ	8 "	8 "	1	φ	8	8
	1	σ	5 "	5 "	1	φ	9 (spots 7 & 8 united)	9 (spots 7 & 8 united)

*This figure is worth a few remarks outside the subject of the paper. The original photograph is a very beautiful and perfect one by Mr. Main of the living moth in resting attitude, natural size. It was hopeless to produce this with any useful effect by the process employed in this plate (or any other?). The brown markings are individual scales, or at most groups of very few. It occurred to me that the photograph could be enlarged so as to overcome the difficulty, and in this case four diameters was decided on with the result shown. It is hardly probable that this simple device has not been resorted to in figuring insects. It is clear, however, that it affords a method of accurately showing details hitherto wanting, and should prove useful in plates of lepidoptera, especially of the smaller species.—T.A.C.

direction of the dots on the underside, and adds that "asymmetry in the spotting of the undersides appears to be very prevalent. He gives (*in litt.*) the following tabulation of the specimens in his collection:—

Reverdin adds that, in all his examples of *argiades* and *alcetas*, either ♂s or ♀s, the two basal points of the posterior wings are present except in one very small ♂ from the Bois Taille, June 1st, 1905, in which they appear to be wanting, but, as the example is not very fine, one possibly ought not to consider it. Of the size variation of the same insects, Reverdin notes:—

Form.	Sex.	Maximum.*	Minimum.*	Sex.	Maximum.*	Minimum.*
<i>Argiades</i>	♂	32mm.	25mm.	♀	32mm.	24mm.
<i>Alcetas</i>	♂	32mm.	24mm.	♀	32mm.	27mm.

Blachier states that, on July 26th, 1907, a single example of *alcetas* was taken at Versoix, in the same locality, and at the same time, as the second-brood of *argiades*, whilst another single example also was taken near Geneva, but on French territory, *viz.*, on Mont Vuache, on July 25th, 1908. He also notes, in confirmation of the statement that *alcetas* sometimes has faint traces of the coloured lunules near the anal angle of the hindwing, that he has, or has seen, examples from Digne, Martigny, Brides-les-Bains, etc., that have traces of the coloured lunules more or less developed, *viz.*, some brownish-red or "sienna"-coloured scales between the black point (carrying metallic scales) and the arc which surmounts it, whilst, in two specimens, there is a trace of colour above the next black point. He considers it confirmatory of the distinction of *alcetas* and *argiades* that these lunules are of a tint approaching orange-yellow in *argiades*, and burnt-sienna in *alcetas*. Verity quotes as additions to the Italian distribution of *alcetas*, Modena, Avezzo—Casentino, Florence and Rome (Rostagno). A named colour-aberration of *alcetas* appears to be confined to south-eastern Europe. This is—

ab. *decolorata*, Staud., "Stett. Ent. Ztg.," xlvii., p. 204 (1886); Rühl, "Pal. Gross-Schmett.," pp. 230, 751 (1895); Tutt, "Brit. Butts.," p. 185 (1896); Rebel, "Lep. Balkans," pt. 1, pp. 186-7 (1896); pt. 2, pp. 181-2 (1903); Staud., "Cat.," 3rd ed., p. 77 (1901); Hirschke, "Verh. zool.-bot. Gesell. Wien," pp. 88, 270 (1903).—I have received specimens of *argiades* from Vienna, Hungary and Bulgaria, with a similar greenish-blue coloration to the var. *decolorata*, Staud., from Margelan. The former, however, appear to be merely accidental aberrations, but seem always to be somewhat larger, and may occur in these countries as a constant form of variation. The six males before me, from these countries, show no trace of red spots before the outer margin on the underside of the hindwings, and must, therefore, be referred on this character to the ab. *coretas*. They may, however, perhaps, be called ab. (or rather may be var.) *decolorata* (Staudinger).

This is a colour aberration of *alcetas*, ♂. Hirschke notes its occurrence in the Czerna Valley, near Herculesbad, between May 21st and June 2nd, 1901, with an almost spotless underside aberration of *E. argiades*, which he named ab. *depuncta*. Rebel observes (*Lep. Balkans*, pt. 1, p. 186) that, "in Bulgaria and East Roumelia, the spring specimens appear to be of the form *polysperchon*. In the summer brood, at Slivno, are found examples which, in the ♂s, have the uppersides green-blue = *decolorata*, Stdgr.; these are, on the undersides of the hindwings, of the *coretas* form, lacking the marginal reddish-yellow submarginal

* Measurements made from apex of wing to centre of thorax, and doubled, these measurements being some 4mm. to 7mm. greater than those made from apex to apex of the forewings of the set insects.

spot; I also took a large ♀ at Slivno, 27mm. in expanse, with unicolorous dark upperside, and the underside also as in *coretas*. Probably similar examples, recorded as *coretas*, occur." He further notes (*Lep. Balkans*, pt. 2, p. 181) that, in Bosnia and Hercegovina, the spring form *polysperchon* has been recorded only from Derwent; but that, at Jaice, specimens of the summer brood with green-blue upperside in ♂s, and without reddish-yellow marginal spots on the underside of the hind-wing, which Staudinger named *decolorata*, have been taken. Aigner-Abafi observes (*in litt.*) that, "in both broods, the ab. *decolorata*, Staudinger, occurs at Budapest, Szaár, and Lipik, the ♂ often with a broad marginal band; the ♀ without blue dusting." Hormuzaki reports it from Bucovina.

NOTES ON COLLECTING, Etc.

RUMICIA PHLÆAS IN OCTOBER.—I captured a ♀ of *R. phlaeas* that was observed near here (Brasted), flying in the the hot sunshine, on October 28th. Its appearance so late was the more striking, as snow had fallen on the previous night and was still lying in sheltered places.—R. M. PRIDEAUX, F.E.S., Brasted Chart, Kent. *October 29th, 1908.*

NOTES ON LIFE-HISTORIES, LARVÆ, &c.

ABERRATION OF LARVA OF PAPILIO MACHAON.—I may note that I obtained seven more melanic larvæ of *Papilio machaon* similar to those already noted (*antea*, p. 240). I had hoped to have reared the imagines to see if they would differ from the type, but a mouse got at the pupæ and ate every one.—P. A. H. MUSCHAMP, F.E.S., Staefa, Züricher-See. *October 29th, 1908.*

NOTES ON ARGYNNIS AGLAIA.—On June 2nd, I received a larva of the above, in its last skin, from Dr. Chapman, who found it near Bude. In appearance it was a much duller object than that figured in Buckler's "Larvæ," lacking the yellowish dorsal stripes entirely, the lateral red spots being, also, smaller and less brilliant than those in the figure referred to. Both *Viola sylvatica* and *V. odorata* leaves, with which the larva was provided, were eaten; there were no regular times of feeding, but, between its meals, it invariably retired to the bottom of its cage. On the least disturbance the larva ceased to feed, for the time being, and, when its cage was moved for changing the food, etc., would jerk or twitch its entire body rather violently. Becoming restless, on June 13th, it appeared to fail to find a suitable place for suspension, and finally pupated, without any attachment, on the floor of its cage. The pupa much resembles that figured by Buckler, but the "two rows of blunt, conical, projecting points" are far less conspicuous, and the last segments are bent completely round, so that the cremastral area all but touches the tip of the wing-cases. The resulting butterfly, a male, was disclosed on July 9th.—R. M. PRIDEAUX, F.E.S., Brasted Chart, Kent. *October 28th, 1908.*

ON THE MUSCULAR FORCE POSSESSED BY THE LARVA OF COSSUS LIGNIPERDA.—Recently one of my boys brought me a full-grown larva of the above. After giving a brief account of its habits, etc., I placed it for the time being in a small chalk box, such as is used for school purposes, and left the lid apart about one-sixteenth of an inch. I placed on the lid a series of weights represent 1850 grammes. Shortly

after, my attention was called to the fact that the prisoner had escaped and was crawling about the floor. I replaced it; within ten minutes it was again out on the floor. I again boxed it up very carefully, the strange point being that the weights showed no evidence of having been moved. In another ten minutes one of my assistants drew my attention to the box, and there was the larva with about one inch of its body protruding through this small orifice (one-sixteenth of an inch); I watched him emerge, which occupied not more than 25 seconds, and carried the box, while he was in the act of forcing his egress, to another class; but alas! my admiration for his energy was turned to pity, for, as the last segment emerged, he fell to the floor coincidentally as I put my foot down, and thus accidentally terminated his existence. —G. E. DIBLEY, F.G.S., Sydenham, S.E. November 1st, 1908.

CURRENT NOTES.

Dr. Harry Federley records (*Medd. Soc. pro Fauna et Flora Fennica*, 1908, 34) the occurrence of *Tapinostola elymi* var. *saturator*, Staud., as an aberration in Finland. Does anyone who now gets the insect freely here know whether the form does occur in this country? or do any of our collectors who are paying special attention to the "wainscots" know anything about it?

Professor T. Hudson Beare has been elected one of the four representatives of the Senators of Edinburgh University upon the University Court, the governing Body of that University.

It is with the greatest regret that we have to announce the death of Lieut.-Col. Charles T. Bingham, F.Z.S., F.E.S., on October 18th, at the age of 61. During his long residence in Further India he had collected a marvellous fund of detailed entomological information relating particularly to Lepidoptera and Hymenoptera, which was always at the disposal of any who really wanted it for scientific use. His term of office on the council of the Entomological Society of London, brought him into contact with many who had scarcely heard previously of this retired and thorough worker, whilst his recent work on the "Fauna of India" has brought him in contact with a still larger circle of admiring friends.

Mr. Edward Saunders notes (*Ent. Mo. Mag.*) *Notochilus hamulatus*, Thoms., as an addition to the list of British Hemiptera, and remarks on its closeness to *N. contractus*, H.-Sch.

Dr. J. H. Wood adds yet another species to the *Phoridae*, viz., *Phora flavicauda*, n. sp., the examples having come from Wall Hills near Ledbury, September 9th, 1907, Stake Wood, July 24th, 1907, and Woolhope, July 24th, 1905.

Mr. Banks reinstates *Hyponomeuta rorellus* in the British list, on the strength of specimens captured in the Isle of Purbeck (Banks), and Brighton (Vine).

The Birmingham Natural History and Philosophical Society is to celebrate the fiftieth anniversary of the Foundation of the Society. A reception and dinner is to be held at the Grand Hotel, Birmingham, on November 17th.

The South-Eastern Union of Scientific Societies will hold its autumn meeting at Tring on the last Saturday in this month (November 28th). Tickets from Mr. H. Norman-Gray, 334, Commercial Road, London, E.

Our readers will be interested to learn that, after a hesitation

lasting over several years, a Standing Business and Publication Subcommittee of the Entomological Society of London has been appointed. The Subcommittee consists of Dr. T. A. Chapman, Messrs. J. Collin, E. Saunders, Shelford, and J. W. Tutt, with *ex officio*, the President, and Officers (Treasurer, Librarian, and Secretaries) of the Society.

In the *Entom. Record* (*antèa*, p. 164) we recently discussed the synonymy of (1) *Nonagria neurica*, Hb., a species which, according to the original figure, has the lower part of the reniform developed as a pale ring surrounding a dark centre, and which was renamed *arundineta* by Schmidt, and (2) an entirely distinct species, with three white dots with dark margins, placed longitudinally along the centre of the wing, discriminated by Schmidt, but referred erroneously by him to *neurica*, Hb., the original figure of which exhibits no such character, and which we renamed *edelsteni*. Two Lewes' entomologists, Messrs. Wightman and Sharp, have run this latter species to earth in their own county this year, and a very fine series of ♂s was exhibited at the meeting of the Entomological Society of London on the evening of November 4th, no ♀s having been taken. Both species, therefore, *Nonagria neurica*, Hb. (= *arundineta*, Schmidt), and *N. edelsteni*, Tutt (= *neurica*, Schmidt *nec* Hb.), are now known to inhabit Britain, and Messrs. Wightman and Sharp are to be congratulated on their discovery.

Another interesting exhibit was made by Mr. L. W. Newman, who showed a long series of *Smerinthus* hybr. *hybridus*. The ♂s appeared to be, in almost all cases, true ♂s, but there were traces of gynandromorphism in the intermediate characters of the antennæ in two specimens, and, though the ♀s superficially were ♀s, it had been shown by dissection that three, at least, had traces of the ♂ genital organs combined with those of the ♀.

A third interesting exhibit was made by Dr. Hodgson, who brought a dozen beautiful specimens of *Anthrocera trifolii* ab. *obscura*, of most extreme form, that had also been captured in Surrey or Sussex during the past season.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—October 7th, 1908.—ABERRATION OF DRYAS PAPHIA.—A remarkable aberration of *Dryas paphia* taken in the New Forest in July last. With the exception of the borders, and the bars, each wing is suffused with a large deep velvety-brown triangular patch, the maculations being entirely absorbed therein, Dr. Herbert Charles. RARE BRITISH BEETLES AND DIPTEROUS PARASITE.—Examples of (a) *Agrilus biguttatus*, F., taken in numbers in bark of old oak in Sherwood Forest, July, 1908. It had not been taken in Britain for about thirty years, this being the first record for the Midlands. Formerly it occurred in Darenth Wood, but appears not to be found there now; (b) *Pyropterus affinis*, not uncommon in Sherwood Forest, July, 1908; (c) a species of *Phora*, with pupæ, bred from larvæ which came out of the body of a *Clerus formicarius* taken alive in Sherwood Forest, July, 1908, with the *Agrilus*, and probably parasitic on it; (d) *Trogolinus anglicanus*, Shp., a specimen taken at Bembridge, August 3rd, 1908, with a specimen from Plymouth, and only known before to occur in New Zealand and at Plymouth, where it was discovered by Mr. Keys. This capture seemed to dispose of the idea that it could have been introduced from New Zealand; (e)

Phyto melanocephala, Mg., bred from wood-lice taken at Bembridge, I. of W., August, 1908, with pupæ, and a wood-louse with dipterous pupa *in situ*. The life-history of the fly was hitherto unknown, though the larvæ of *Rhinophora atramentaria*, Mg., a nearly-related species, have been recorded as parasitic on *Oniscus asellus*, Mr. H. St. J. Donisthorpe. GYNANDROMORPHIC *PIERIS NAPI*.—A gynandromorphic example of *Pieris napi*, bred from parents taken in North Cornwall this year, Mr. A. Harrison. RARE BRITISH ODONATA.—Rare and interesting dragon-flies taken in the British Isles in 1908, including (a) *Sympetrum fonscolombii*, Sélys.—A ♂ and ♀, taken in Hertfordshire on June 24th and July 27th respectively; (b) *Sematochlora metallica*, Lind., a ♂ captured in Sussex on August 4th, being the first authentic record of this insect in England; Dr. Buchanan White discovered the insect in Scotland in 1869, and Mr. J. King, of Glasgow, took it again in 1899 in the same locality; (c) *Anax imperator*, Leach, a ♂ caught with *Libellula depressa*, ♂, in its jaws in Hertfordshire on June 24th; (d) *Libellula depressa*, Linn., two ♀s taken late in the season, showing the appearance of blue powder on the abdomen; (e) *Libellula quadrimaculata*, Linn., four specimens; two taken in Sussex, showing the remarkable difference in the amount of suffusion on the wings in individuals; the other two from widely different localities, one from North Wales, showing great, and one from Ventnor, Isle of Wight, showing very little, wing-suffusion. The greatly suffused specimen from Sussex had no black suffusion under the pterostigma, which is normal, Mr. E. R. Speyer. RARE BRITISH ODONATA.—Specimens of *Aeschna isosceles* and *Libellula fulva* from Norfolk Broads, taken in June last, and *Orthetrum caeruleum* from Chagford, taken in July, Mr. H. M. Edelsten. PARASITES ON FLIES.—A spike of the grass *Molinia caerulea* with dead Syrphids, *Melanostoma scalare*, Fabr., attacked by the parasitic fungus, *Empusa muscae*, found on Esher Common, October 3rd, 1908. Many, or most, were attacked by the point of the head only, in a very peculiar manner, and apparently all were females, Mr. W. J. Lucas. CRYPTAMORPHA *DESJARDINSI* IN HAMPSHIRE.—A specimen of *Cryptomorpha desjardinsi*, Guér., that had been found by Mr. C. F. Selous running on a table-cloth in his house at Barton-on-Sea, Hants, on June 26th. This beetle is recorded as living on banana plants in Mauritius and Madeira, and may have been introduced here in the banana fruit, Mr. O. E. Janson. RARE BRITISH HEMIPTERA.—Specimens of the following insects: *Aleochara crassiuscula*, Sahlb., taken at Gt. Yarmouth in May, 1908; aberrations of *Donacia dentipes* and *D. simplex*, from Caistor Marshes; *Nabis boops*, Schiödt, taken at Esher, in August, 1908; and *Idiocerus scurra*, Germ., taken at Blackheath, Kent, in September, 1908, Mr. G. C. Champion. RARE AND VARIABLE BRITISH HETEROCERA.—Specimens of (a) *Crymodes exulis* from the Shetlands, including one female. The female of this species is very rare and until this season (when some six or seven were taken) only a very few were known. One ♂ exhibited was of the rich dark brown form, while the rest were of the light brown form; (b) *Callimorpha dominula*, two yellow aberrations bred from East Kent ova. In 1906 a yellow ♀ was bred. This was paired with a typical red ♂ and the result in 1907 was that the whole brood consisted of typical "reds." These "reds" were paired, and, in 1908,

the brood (a small one) produced 25 per cent. of the yellow form; (c) *Camptogramma fluviala*, a varied series bred from ova laid by a ♀ taken at Eastbourne, the most remarkable specimens being a ♂ with the band broken in the centre, a ♂ with the band entirely wanting, and a ♀ devoid of the usual orbicular spot; (d) a yellow aberration of *Noctua rubi*, from Yorkshire, Mr. L. W. Newman.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—September 24th, 1908.—ABERRATIONS OF LEPIDOPTERA.—A dark suffused specimen of *Brenthis pales* from Saas-Fée, and an example of *Anthrocera exulans* var. *flava* from the same locality, Dr. Chapman. OPHIODES LUNARIS.—An example of *Ophoides lunaris*, bred in July, 1907, from an ovum sent him from south France by Dr. Chapman, Mr. Cowham. EUPITHECIA ABSYNTHIATA IN IRELAND.—A long series of *Eupithecia absynthiata*, bred from larvæ collected on ragwort near Cork, Messrs. Harrison and Main. ABERRATIONS OF LEPIDOPTERA.—Long series of *Agriades corydon*, taken near Dover, including var. *obsoleta* and many blue females; many blue females of *Polyommatus icarus* from north Kent, and two striking forms of *Dicranura vinula*, one very dark, with almost chocolate suffusion, the other having the zigzag lines unusually cleanly cut and dark, the middle area being very light, Mr. Newman. CELASTRINA ARGIOLUS LARVÆ.—Living larvæ of *Celastrina argiolus*, including one example which had been of an obscure red colour through all its instars, Mr. Coote. PARNASSIUS APOLLO BRED.—*Parnassius apollo*, the imago bred from the larva exhibited at a previous meeting, and made remarks on the differentiation of the larva from that of *P. delius*, Mr. Sich.—October 8th, 1908.—SWISS COLEOPTERA.—About 70 species of Coleoptera, Hemiptera, etc., taken by him in July, 1908, in Central Switzerland, including *Trichius fasciatus*, *Tricodes apicarius*, *Oedemera podagrariae*, *Leptura rubra*, *Clytus massiliensis*, *Strachia ornata*, *Oedipoda caerulea*, etc., Mr. Ashdown. ABERRATIONS OF BUTTERFLIES.—Two bred specimens of *Enodia hyperanthus* ab. *caeca*, from Surrey, and a bred specimen of *Melanargia galathea* approaching var. *procida*, from Hampshire, Mr. Tonge. PSEUDOTERPNA PRUINATA.—A bred series of *Pseudoterpna pruinata* (*cytisaria*) from Epping Forest, showing great variation in the size, distinctness, and presence of the usual submarginal light coloured line, Messrs. Harrison and Main. VARIOUS LEPIDOPTERA, INCLUDING PARTIAL SECOND-BROODS.—A bred series of *Malacosoma castrensis* from Essex, including the rare yellow unicolorous ♀, and the dark chocolate ♂; a bred series of *Egeria andreniformis* from North Kent, where it was much subject to the attacks of ichneumons; a series of *Hepialus humuli* var. *hethlandica*, and a few *Pachnobia hyperborea* from Shetland, some *Anarta melanopa* from Rannoch, a second-brood bred example of *Abraxas grossulariata*, October 8th, the first to emerge from over 100 pupæ; a living *Thera firmata* second-brood, and a living second-brood specimen of *Eumorphia elenor*, Mr. Newman. OVA OF TORTRICID.—Recently deposited ova of *Tortrix promubana*, Mr. R. Adkin. NORTH KENT LEPIDOPTERA.—Mr. J. P. Barrett made a comparison of the lepidopterous fauna of North Kent 30 years ago and that of to-day, illustrating his remarks by series of *Aporia crataegi*, *Nonagria sparganii*, *Acidalia ochrata*, *Agrotera nemoralis*, *Tapinostola morrisii* (*bondii*), *Eremobia ochroleuca*, etc. GYNANDROMORPHOUS TRICHIURA CRATEGI, etc.—A ♀

Trichiura crataegi with one antenna ♂; also an *Epinephele jurtina* (*janthina*) from Box Hill with large pallid spaces, and a bred series of *Rhodophaea suarella* from Eastbourne, Mr. South, on behalf of Mr. Waller. LIVING MANTIDS.—A living "stick" insect bred from the ovum shown in the spring, Mr. Main. GILLMERIA PALLIDACTYLA.—Bred *Gillmeria pallidactyla* from Byfleet, Mr. Sich.

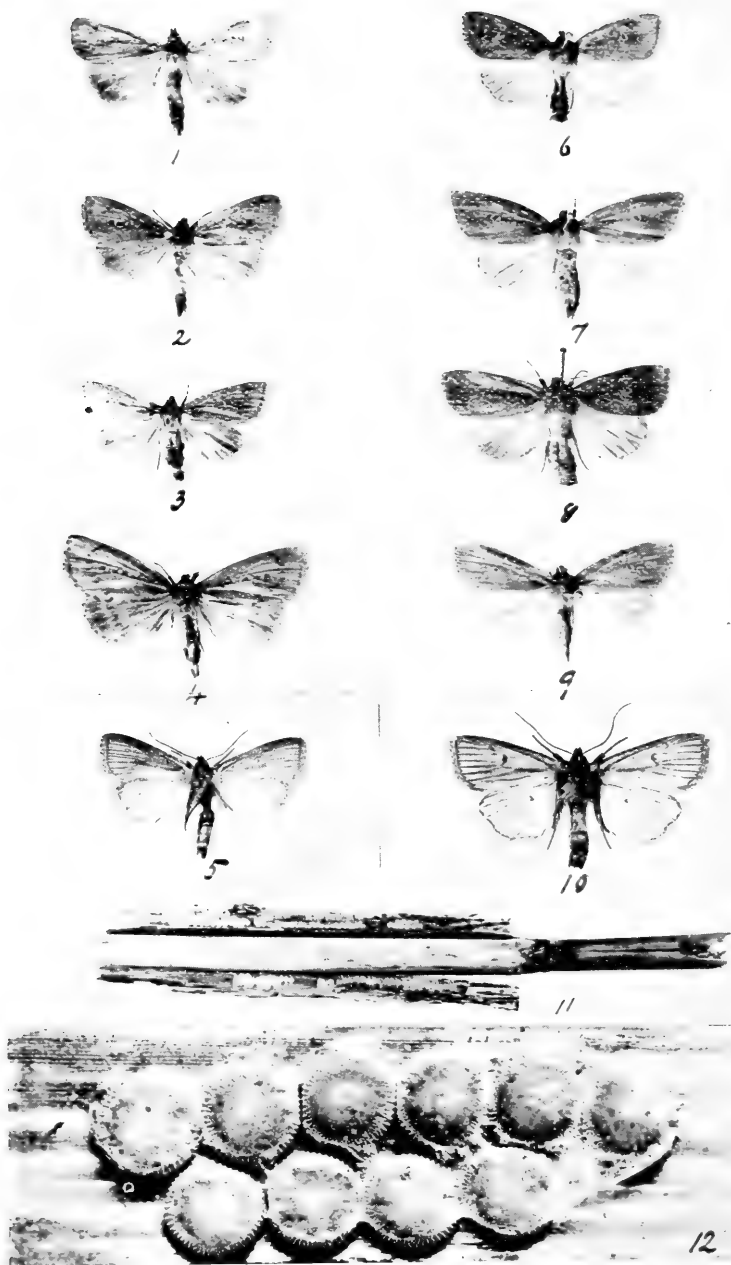
CITY OF LONDON ENTOMOLOGICAL SOCIETY.—October 6th, 1908.—EXHIBITS.—CAMPTOGRAMMA BILINEATA from Margate, July 1908, including a specimen with broad black band on forewings, Mr. J. A. Clark. STERRHA SACRARIA.—A specimen taken by himself in South Devon, September 1908, Mr. H. M. Edelsten.—GRAMMESIA TRIGRAMMICA AB. BILINEA.—Six specimens taken June, 1908, in Kent, on two evenings on sugar-patches close to one another, while the rest of a somewhat extensive "round" yielded no examples of this form, Mr. J. H. Heath. AGRIADES CORYDON AB. OBSOLETA from Dover 1908. MALACOSOMA CASTRENSIS, including unicolorous males and yellow females ab. *obsoleta*, Tutt, Mr. L. W. Newman. EUPITHECIA EXPALLIDATA.—A large bred specimen of a dark strongly-marked aberration from Tunbridge Wells. NONAGRIA SPARGANII.—A strongly black-marked aberration from East Kent. Also, on behalf of Mr. Taylor, an AGROTID (? sp., apparently an aberration of *Agrotis segetum* ♀), with a dark cloud round the pale stigmata, taken October 3rd, 1907, Mr. L. B. Prout. CEMIOSTOMA LABURNELLA.—Cocoons of, showing the strength of the silk in bending the materials upon which the cocoons were spun. NEPTICULA ACETOSA.—Mines containing larvæ in leaves of *Rumex acetosa* from Richmond, Mr. A. Sich. LEUCANIA VITELLINA, a series taken on the Dorset Coast, August 15th-30th, 1908, Mr. P. H. Tautz. ADKINIA GRAPHODACTYLA.—Ova, pupæ, imagines, and ichneumon, and the food-plant *Gentiana pneumonanthe*, Mr. A. J. Wilsdon. October 20th, 1908.—EXHIBITS.—EUCHLOE CARDAMINES.—Pupæ attached to twigs and cards of various shades, and showing distinct gradation of depths of colour, corresponding to the lightness or darkness of the substance on which the larvæ had pupated, Mr. A. Bacot.—TANAGRA ATRATA VAR. PYRENIACA bred from Gavarnie ova, Dr. T. A. Chapman. OVA OF LEUCANIA BREVILINEA laid within the sheathing-leaf of dead reed stem, Norfolk, July 1908, Mr. H. M. Edelsten. LYCAENA ARION PUPA.—A dead specimen found by Mr. Percy Richards under stones near Bude, Mr. W. J. Kaye. HEPIALUS HUMULI VAR. HETHLANDICA from the Shetlands, showing considerable variation. ANARTA MELANOPE from the same locality, and aberrations of RUMICIA PHLÆAS from Bexley, October 1908, including a specimen with greyish-black underside, and a female with the usual band on hindwings obsolete, Mr. L. W. Newman. STAUROPUS FAGI.—A series bred from ova from Chalford Road, including a dark female, Mr. P. H. Tautz.

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY.—October 19th, 1908.—CAPTURES, ETC., OF 1908.—A long series of *Agrotis agathina*, bred from Welsh larvæ, and noted that the red form occurred much more frequently among wild imagines than among moths bred at Manchester from larvæ taken on the same ground earlier in the year. From the Isle of Wight, fine series of the following: *Agrotis lunigera*, *A. cinerea*, *Acidalia humiliata*, *Setina irrorella*; from Pendine, South Wales, *Boarmia repandata* var. *conversaria*, *Callimorpha dominula*;

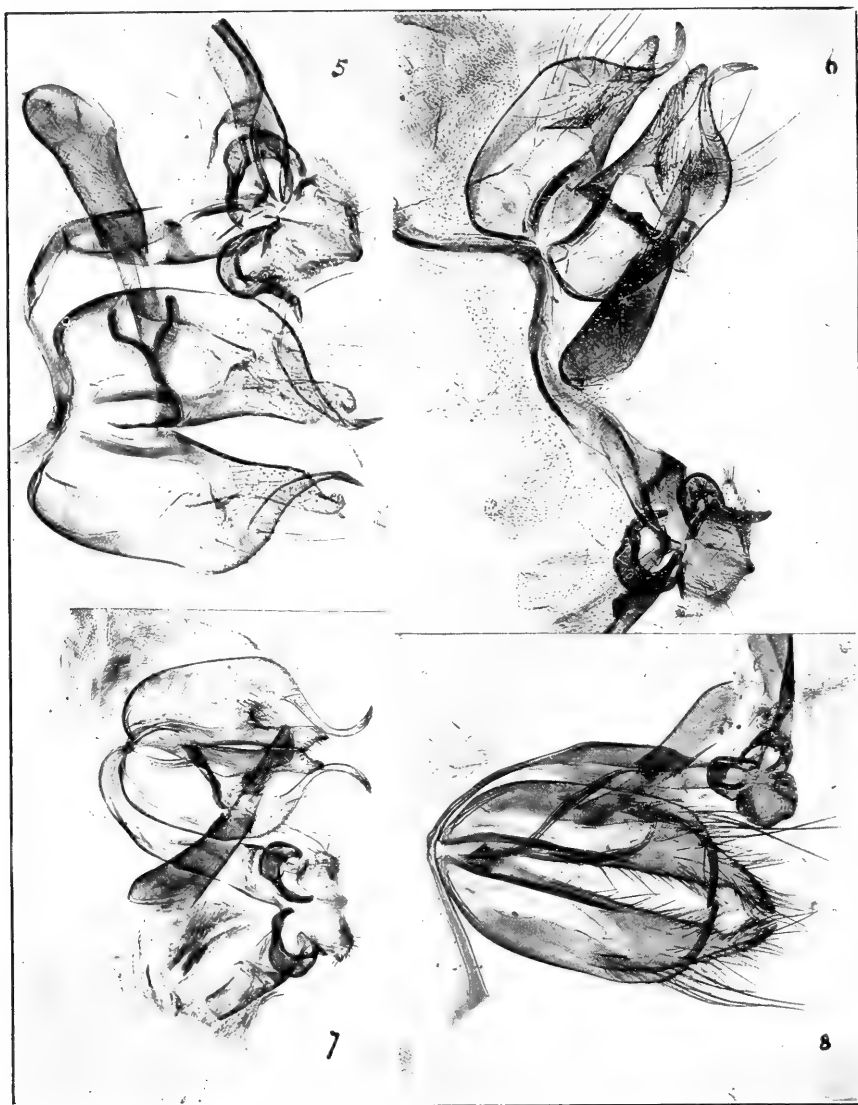
from Lakeside, *Numeria pulveraria*, *Tephrosia conversaria*, and a very long series of *T. crepuscularia* (*biundularia*), varying from almost white to the extreme form of *ab. delamerensis*, Mr. R. Tait, junr. Mr. Tait also stated that he had bred a partial second-brood of *Boarmia repandata* *ab. conversaria*, *Aplecta herbida*, and *Acidalia humiliata*, a living example of which he exhibited at the meeting. LEPIDOPTERA OF WARRINGTON MOSSES AND DELAMERE.—A series of *Lithosia sericea*, and a red form of *Leucania pallens*, from Warrington; *Macaria liturata* var. *nigrofulvata*, a short series from Delamere Forest, Mr. Mounfield. A further series of *Lithosia sericea*, as well as *Hydroecia petasitis*, *H. lucens*, *H. nictitans*, *H. paludis*, *Hadena glauca*, *Dyschorista suspecta*, *Agrotis nigricans*, and *Acrionicta leporina* *ab. melanocephala*, all from Warrington and neighbourhood; while from Delamere Forest he showed *Aplecta nebulosa* *ab. robsoni* and *Lithosia mesomella*, Mr. Robinson. VARIABLE LEPIDOPTERA.—A series of *Abraxas grossulariata* and aberrations from St. Anne's, and short series of aberrations of *Polia chi*, including *ab. olivacea* and melanic forms from Yorkshire, also strongly marked typical specimens of this variable moth from Barmouth, Mr. T. Baxter. LEPIDOPTERA FROM THE NORTH-WEST.—*Abraxas sylvata* and *Noctua glareosa* from Carnarvon; *Eupithecia pulchellata* from the Lake District; *Dasychira fascelina* from Formby; *Celaena haworthii* and *Luperina cespitis* from Delamere Forest, Dr. Edwards. *Aplecta nebulosa* with *ab. robsoni* and *Boarmia repandata* from Delamere; *Cucullia asteris* from Essex; *Moma orion*, bred from New Forest pupæ which had lain over two winters, Mr. H. R. Sweeting. ABERRATIONS OF LASIOCAMPA QUERCUS.—Aberrations of *Lasiocampa quercus* from Wallasey, including the olive form; Dr. Bell, stated that the larvæ, from which the olive form was bred, were black, with very dark brown hairs; this had also been noted by other collectors and was supported by a further exhibit, by the same member, of young larvæ from olive parents and from typical parents, in which this difference was well seen*. CELERIO GALLII REPORTED FROM WALLASEY.—A specimen of *Celerio gallii* bred from one of the two larvæ reported from Wallasey, September, 1907, Mr. Mallinson. MELANIC LEPIDOPTERA.—A series of *Aplecta nebulosa* *ab. robsoni*, very dark forms, and *ab. pallida* bred in 1908; *Polia chi* var. *olivacea* from near Leeds, and stated that this form had apparently increased from about 5 per cent., noted in 1890-1, to about 20 per cent. noted this year. A series of black *Boarmia repandata* from Knowsley, Lanes., and a male *Porthesia similis* from Simonswood, without the black spots on the hindmargin of the forewings; a short series of *Peronea permutana* from Wallasey, Mr. Mansbridge.

* This statement involves much. It suggests the pairing of olive specimens either found wild or in confinement, and an actual family difference in those larvæ compared with those from normally-coloured parents, and a further supposition that, because they are dark they will produce olive-coloured progeny. We should like to have a detailed scientific statement of the facts from Dr. Bell as far as they have at present been observed. This record states either too much or much too little.—Ed.

ERRATA.—Page 215, line 22. For "3½ inches" read "2½ inches."—J. A. CLARK. Page 229, line 38.—For "*Medicago sativa*" read "*Medicago lupulina*."—H. DONISTHORPE.



NONAGRIA EDELSTENI, TUTT (FIGS. 1-5), AND NONAGRIA NEURICA, HB. (FIGS. 6-10).
The Entomologist's Record, etc., 1908.



F. N. Clark. Photo.

COMPARISON OF MALE ANCILLARY APPENDAGES OF EVERES AND BINGHAMIA.

(Figs. 5-7.—*Everes amyntula*. Fig. 8.—*Binghamia parrhasius*.)

Lepidoptera of the Grisons—The Strela Pass.

By J. W. TUTT, F.E.S.

From Davos-Platz a cable railway lifts one up the steep sides of the Strela mountain for just about 1000ft. elevation, to the Schatz Alp, in about twelve minutes, and deposits one at once at 6150ft. elevation on the upper level of the pines, and on the borders of the pastures that stretch rapidly away over the Strela Alp to the Strela Pass, a footpath leading thereby to Langwies, in the Schanfigg-Thal. One sees a large number of what one assumes to be *Erebia ligea* and two or three species of *Anthrocera* on the way up, and around the station itself *E. ligea* occurs, but this insect of the valleys and woods does not extend to the pastures. The owners of the large sanatorium here have planted young pines on the slopes for some distance above, no doubt to act as a further shelter, but at present they are only a few inches in height and have not yet affected the natural vegetation, which, doubtless, will be largely exterminated as the pines grow. Consumptive patients in various stages of the disease are very numerous, and to be seen sitting by, or slowly walking up, the newly-made paths near, and just above, the sanatorium, but one very quickly scrambles above the sickness that meets one everywhere at Davos, which certainly is not a place in which to spend "a happy day." The pastures are for a time fenced in, so that cattle do not wander at will, and here, on the flowers, one finds an abundance of *Coenonympha satyrium*, *Melampias melampus*, *Erebia tyndarus*, with some *Chrysophanus hippothoe* and *Loweia subalpina*. *Anthrocera achilleae*, with rather ill-developed spots, is going over, as also is *A. transalpina*. *Malacosoma alpina* appears to be frequent, several ♀s being observed as one walks through the tall herbage.

The morning of August 2nd, 1908, was really lovely on the slopes above the Schatz Alp. The sky was cloudless, and the air delightfully soft and fragrant, very different from the cool, damp, piercing chilliness of the preceding evening. Beyond the fenced portion, the natural pastures had been cattle-trodden, but were not spoiled for insects, as is often the case on the high alps near large towns and villages. Working steadily upwards, one found, besides *Erebia tyndarus*, *Argynnis niobe*, and *A. aglaia*, fair numbers of *Colias phicomone*, *Brenthis pales*, and *Polyommatus orbitulus*, and our attention was soon devoted to getting together a good series of the latter, a rather difficult matter, as the ♂s were worn and the ♀s none too common, and considerably over an hour quickly passed without getting more than a couple of dozen examples up to cabinet standard, although others were picked up all day up to the summit of the Pass. Much time, too, was spent in watching the habits of this species, and ♀ after ♀ was watched down, and seen slowly to walk among the herbage as if on egg-laying intent, but with no result. Everywhere one met with *Pieris brassicae* in numbers, flying quickly or settling on flowers, even up to the summit of the Pass. Many purely alpine insects, that never seem to come low down, were soon struck, amongst others, *Melampias epiphron*, *Erebia gorge*, and *E. lappona*, a few *Psodos quadrifaria*, *P. trepidaria*, etc. *Melampias epiphron* flew fairly rapidly and continuously over the pastures; *Erebia lappona*, of fairly large size, rose quickly, got into the wind, and swiftly, although apparently so gently, was carried

DECEMBER 15TH, 1908.

100 yards or so before dropping again, so that much hard work was required to get specimens, especially as the pastures ascend so steeply. *E. gorge*, true to its usual character, preferred the rough and stony places, darting quickly from one resting-place to another when disturbed, and keeping so close to the ground, on which it prefers to rest sideways, that it was not at all easy always to spot, and was much better covered than allowed to get up before a shot was made. There was no trace of the *triopes* form, all the examples having two spots upon the apex of the forewings, except one which shows a tiny third. The fine fresh ♂ *Brenthis pales* are very beautiful as they swing with expanded wings in the sunlight on a composite flower, whose orange seems to sometimes attempt to match their own browner hue; the ♀s are almost of the colour of the ♂s, only a few being rather paler than the rest, and then not markedly so. The lovely *Crambus luctiferellus* occasionally occurred near the summit of the Pass, whilst *C. coulouellus* was rather common, both here and for some distance down, both species being disturbed as one walked through the herbage, and resting again at a little distance. The ♀s of both species laid eggs in the boxes in which they were enclosed. Those of the beautiful *C. luctiferellus* were laid loosely, pale yellow in colour, and, as far as could be made out with a hand lens, were almost barrel-shaped, with about ten well marked longitudinal ribs. Those of *C. coulouellus* were also laid loosely, pale yellow in colour, but of a rather lighter tint than those of *C. coulouellus*; they were also much smaller, less rounded, although still barrel-shaped, but a little flattened on the top, whilst the ribs appear to be rather coarser, and not more than eight in number, although not too certainly made out. *Crambus conchellus* was common. Now and again, right at the summit of the Pass, a specimen of *Nemeophila plantaginis*, or its ab. *matronalis*, was disturbed, and one is always set thinking as to the cause of the remarkable distribution in altitude of this species, for it appears to be quite as much at home on these high storm-swept alps, covered with snow for fully seven months in the year, as *Anthrocera exulans*, which also freely occurred here, yet it comes down to sea-level and haunts the warm woodlands of central Europe. One specimen of *A. exulans* was very strangely aberrant, the left forewings being of the ab. *striata* (Brit. Lep., i., p. 448), the right forewings with normal five spots, a real *semi-striata* individual. The *Polyommatus orbitulus* also proved interesting; some of the examples have, on the underside of the hindwings, no costal or any of the transverse row of spots, the discoidal standing alone in the centre of the wing, whilst the basal spots are also absent = ab. *obsoleta*, others have the normal spots showing only as white blotches without kernels = ab. *albipuncta*, whilst others have a mixture of white and kernelled spots; on the forewings, too, not only were there examples with no basal spots = ab. *sinepuncta* (parallel with the ab. *icarinus* of *P. icarus*) but others had one only = ab. *unipuncta*, and others again had two, as in many of the allied species. The *Melampias epiphron* also varied considerably, some were wholly dark with hardly a trace of dots on any of the wings, and distinctly inclined to the *obsoleta* form, whilst others had a good fulvous band with distinct dots, others again being intermediate. A single ♂ *Urbicula comma* was netted, the only one seen in the Davos district, so that one suspects it was not yet out; but a single large pale ♂ *Setina irrorella*, and some worn *Scopula alpinalis*, suggested that these species were over. On the highest pastures *Pygmaena fusca* was not infrequent, whilst *Adkinia*

coprodactyla was disturbed occasionally at all elevations reached. Lovely *Aglais urticae* bustled about nearly at the summit of the Pass, and were quite at home there, although small larvæ were seen next day in the Dischma-Thal 2700 feet below, where also freshly-emerged imagines were taken, showing how long some hybernated examples must remain dormant in the more exposed places, and how early they get on the wing when placed in better surroundings. From 7500ft.-7800ft., near the summit of the Pass, masses of snow still lay in the hollows not fully exposed to the sun, whilst on their edges the grass and other plants were just putting forth their tender yellow-green leaves, having just discovered that their short spring-summer had arrived, whilst much of the ground now covered with grass one suspects was a month or six weeks earlier in like case.

Orthoptera in East Kent in 1908.

By MALCOLM BURR, B.A., F.L.S., F.Z.S., F.E.S.

The season in East Kent has been productive of nothing startling. *Apterygida albipennis*, Meg., maintains its abundance in its old haunt at Stonehall, and I was glad to find that its distribution extends towards Dover, for I found it in numbers at Watersend, nearly half a mile to the south of the original colony, and again to the west of the village of Lydden itself, half a mile from Stonehall. I find upon inquiry that there was a hop-garden at Stonehall some thirty years ago, and this probably accounts for the existence of the colony, for this species appears to have a predilection for hop districts, at least in this country.

Forficula lesnei, Finot, I have not yet found in East Kent outside the Folkestone Warren, where I first swept it twelve years ago.

Ectobia panzeri, Steph., is abundant on the sandhills which extend along the shore line in Sandwich Bay from Deal to Shellness. One dull wet afternoon, at the Warren, Mr. Ernest Green found four immature females, on September 27th, by grubbing among the roots of the grass. This species does not probably extend far inland; persistent search revealed a single female, among roots of the grass, in the hillsides by Sunny Carvett, a couple of miles south-west of Lydden.

Stenobothrus lineatus, Panz., I found only in three localities, already recorded, namely, the Warren, Stonehall, and Golgotha, near Sibertswold.

Omocestus viridulus, L., is common enough in East Kent, and I have found it in most localities, Ham Ponds, Sandwich Bay, Golgotha, Stonehall, Chalksole and Ewell Minnis.

O. rufipes, Zett., has not yet turned up. I formerly looked upon this handsome grasshopper as fairly common, because I took it in numbers round Radley and Oxford, where I first collected grasshoppers, but experience has taught me that it is one of our most local species.

Stauroderus bicolor, Charp., and *Chorthippus parallelus*, Zett., of course swarm everywhere. The former occurs in all colours of the rainbow, but the latter does not vary much. The fine autumn kept

these species out at least as late as October 30th, on which day both were busy chirping in the warm sun at Langdon Hole, near Dover.

It is fortunate for our British orthopterists that our eight true grasshoppers represent five distinct genera. The clavate antennæ of the two British species of *Gomphocerus* render them unmistakable, and they do not resemble each other even superficially. The other six, which were all formerly included in the comprehensive genus *Stenobothrus*, often discourage beginners, but in reality offer no difficulty, for they represent four distinct genera, so that, in most cases, the characters which distinguish them are not specific, but generic. *Stenobothrus* is restricted by Bolivar to those species in which the valves of the ovipositor of the female are toothed, and the discoidal area of the elytra is ample, with regular, almost parallel, reticulations. This feature is very prominent, and in our only British species of *Stenobothrus*, can be detected at a glance. We have not to distinguish *Stenobothrus lineatus* from its relatives, *S. fischeri* and *S. nigrogeniculatus*, but from grasshoppers with totally distinct generic characters. The wide discoidal area gives the stridulation of this handsome species a distinctive tone, which cannot be confused with the song of any other British grasshopper. It is a shrill, high-pitched, continuous chirp, almost a whistle, on hearing which I confidently record the species, even if I am unable to see or find a specimen.

In *Omocestus*, as in all other British forms except *Stenobothrus*, the valves of the ovipositor are not toothed, but the lower valves are long and sinuous; the keels of the pronotum are bowed, the discoidal area of the elytra is narrow and irregularly reticulated, and the scapular area is not dilated. We have two British species, *O. viridulus* and *O. rufipes*; in both these the stridulation is a long and prolonged vibration, but I doubt whether any human ear can discriminate between them; the song of no other British species resembles in the least degree this maintained whirr of our two *Omocestus*. The bold red and black coloration of *O. rufipes*, with its white palpi, is readily distinguishable from the dull green or olive of *O. viridulus*. *Stauroderus* contains a good many species, but we have only one, the exceedingly variable and extremely abundant *S. bicolor*; it may be red, green, black or brown, plain or striped, mottled or speckled, but it is only the British species with angled keels on the pronotum, and with broad, short, mediastinal and dilated scapular areas.

Of *Chorthippus*, with its parallel keels, we have only two species, *C. parallelus*, with abbreviated wings, and *C. elegans*, with fully developed organs of flight; there are, of course, other points of distinction, but these are more subtle. The validity of *C. longicornis* is now perhaps established, and this species should be sought for in England. The points of distinction are discussed in the *Ent. Rec.*, xi., p. 244 (1899). The stridulation of *C. elegans* is too faint to be very useful, and it rather resembles the short, deep buzz, buzz of *S. bicolor*. *C. parallelus* is less monotonous and easily recognised. *C. elegans* swarms on the sandhills in Sandwich Bay, and also occurs in the Ham Ponds.

Gomphocerus rufus, L., swarmed in the middle of the Warren in 1896, but I failed to find it in subsequent years. Mr. Ernest Green, Mr. Fenwick and I then found it in swarms. It is a very distinctive but localised species.

G. maculatus, Thunb., is pretty, variable, and quite common, though I have not found it in many places in East Kent.

Tettix bipunctatus, L., is, of course, common enough, but *T. subulatus*, L., is more localised than I used to think. I have found it at Radley, Marston, Dormans, but almost always in damp situations.

Leptophyes punctatissima, Bosc., is very common, and may always be taken by sweeping in suitable situations. In my garden at Eastry, at Sibertswold, and in the Warren, it is quite numerous.

Meconema varium, Fabr., is another very common insect in my garden; I take it by beating limes.

Xiphidium dorsale, Fabr., is quite local. I found a colony in Sandwich Bay and a few specimens in the Ham Ponds, near Eastry, a good locality, where we put up mallard and heron, and where the redshank breeds.

Locusta viridissima, L., is common in East Kent, and is found a good many miles inland. It is abundant in Sandwich Bay, the Warren, and at Herne Bay, and also occurs at Eastry, Fredville, Adisham, and doubtless in numerous other localities.

Olynthoscelis griseo-aptera, De Geer (= *Thamnotrizon cinereus*, L.), betrays his presence by his perpetual chirp. In *Insects at Home*, p. 251, the late Rev. J. G. Wood remarks that the female of this species is common enough, but the capture of a male is "an event in an entomologist's day." The author must have been hard of hearing, for the male always betrays his presence by his characteristic stridulation, whereas the mute female can only be found by hunting among the thickets. The hedges round Eastry resound at night with the incessant chirping of crowds of this striking insect, but it requires a certain amount of patience and skill to actually catch the male, on account of its agility, though they can often be seen. Once recognised, its chirp cannot be forgotten, and, though low, it is so penetrating that the accustomed ear can detect it even through the conflict of other sounds. When walking and talking, and even cycling along the roads of East Kent, from August to October, I can always hear the low insistent *tss, tss, tss*, on fine warm afternoons and evenings. I have never yet looked for it in vain in suitable situations, during the season, in East Kent, Isle of Wight, and the neighbourhood of East Grinstead and of Oxford, the only localities where I have looked for it. I consequently look upon it as abundant and universally distributed throughout at least the southern half of England.

Platycleis grisea, Fabr., is common in the dunes of Sandwich Bay and at the Warren, but is not found far from the coast.

P. brachyptera, L., perhaps does not occur in East Kent; I have not come across it here, because there is not much heather or moorland. There must be a colony of *P. roeselii* at Herne Bay. I wish I could find it.

Decticus verrucivorus, L., maintains its colony at Stonehall. I have not found the colony at St. Margaret's. It requires patience to stalk it down, and it only chirps when the sun is hot. Once detected it can be easily followed, as its oily green colour and great long legs make it look like a frog as it makes its huge springs in the long grass. There are probably other colonies. I hunted carefully in the lonely and sheltered grass-slopes of the Lydden-Watersend Valleys, but found nothing there, indeed, nothing of any interest

except the *Ectobia panzeri*, referred to above, and the ubiquitous *O. griseoptera*.

The field cricket and mole cricket have not occurred yet, but there is no reason why they should not do so. In the flat districts there are plenty of suitable situations, and the task before orthopterists, in East Kent now is to find these two crickets and the colony of *Platycleis roeselii* at Herne Bay.

The Lepidoptera of the Bogs above the Züricher-See.

By J. W. TUTT, F.E.S.

(Concluded from p. 248.)

We still skirted the lower parts of the hollow and a few *Cyaniris semiargus* and *Polyommatus icarus* were netted, quite at home on the bog, large in size, and both the former rather worn, and then a large "blue," with the appearance and flight of *Lycaena arion*, caused a rapid move in its direction. The specimen proved to be *Lycaena alcon*, a species quite new to us in nature, and another and another were quickly taken, but none were really fine; a ♀ however, newly-emerged, was quite black, of a sooty-colour and of a soft mealy texture that reminded one strongly of the ♀ *L. arcas*, and made one believe that it was of that species, except for the grey and not brown colour on the underside. This is probably the ab. *nigra*, Wheeler. Several ♀s were taken, all of this form, so that it is quite racial here, and not an aberration, and entirely different from the other ♀s in our collection—from Fusio, Campiglio, etc. The ♂s, too, are of a brighter blue than any others that I have in my collection. I do not find the slightest trace of red in the tint. Another *Euvanessa antiopa* was netted, and then *Pyrameis atalanta* and *Aglais urticae* were observed on the flowers on the outskirts of the bog, whilst *Polygonia c-album* flew along by the side of the trees. Numbers of *Lowia doritis* of both sexes, of exactly the same form as those in the meadows, were also on the flowers at the edge of the bog, and at least a dozen species of dragon-flies were observed in a few minutes, but we were unfortunately too occupied with the lepidoptera to do more than notice them. The Crambids were particularly abundant, and several species, *Crambus adipellus*, *C. selasellus*, *C. perllellus*, *C. margaritellus*, etc., were noted.

Having collected round the edge of the bog, serious work, a little hampered by the fact that the men were already cutting the herbage for litter and objected to its being trodden, commenced for *Coenonympha tiphon*, and, by dint of selection, a very nice series was obtained. As already noted, they were of the "middle form," but showed considerable minor aberration, both on the upper- and undersides. On the uppersides, the ♂s varied from a deep tawny, with dark hindwings, some exceptionally so, to a considerably lighter form, whilst the undersides showed a range from entire grey, to brown, although mostly the bases were brown, and the outer marginal area grey. The spotting on the upperside also varied; there were examples showing only one (or no) spot near the anal angle of the hindwings, and none on the forewings, whilst, at the other extreme, were three on the forewings, and four on the hindwings, but very rarely so many. On the undersides, the spotting varied from none on forewings, and none on hindwings, to five on forewings, and seven on hindwings; usually, the ocellation is well-

marked, but never to the extent of our "southern" English form with its fulvous external rings. The ♀s on the upper-side are, on the whole, paler than the ♂s, one has the appearance of a large ♀ *C. pamphilus*, both in tint, shape, and spotting. The most beautiful, however, is a ♀ with the hindwings uniform silky-grey, of the tint sometimes indicated marginally = *ab. posterogrisea*, n. ab. One ♂ with only a single spot at anal angle of hindwing, the rest of the spots obsolete, is distinctly of the *laidion* form, which here then occurs as an aberration. Nothing here reaches quite what we, in Britain, call *philoxenus*. Working on through the bog, we at last struck rather drier ground, with a few beech and alder trees forming a sort of hedge between a sloping bank and the rising ground on the other side, the bog at this point forming merely a narrow strait or ditch. Here, on the flowers, *Gonepteryx rhamni* was in great abundance, with *Epinephle ianira*, etc., whilst from a *Centaurea* flower I netted a freshly-emerged ♂ *Ruralis betulae*. Round the trees a few of the dark form of *Pararge aegeria* were observed, and here, too, was yet another freshly-emerged *Euvanessa antiopa*. The open woods came down to the edge of the narrowed bog, and, with the woods, *Argynnis adippe*, *Erebia aethiops*, and other interesting species appeared, whilst a single *Celastrina argiolus* was netted by Mr. Muschamp on a slope near. As the wood receded again, the bank offered attractions, especially as the bog nearly disappeared on the other side of the ditch and cultivated meadows almost reached us. These banks were peculiar, for, although sloping sufficiently one would think to be drained easily, they were so supplied with water from the springs that everywhere trickled from the wood, and so tenacious in their hold on the water that one observed the peculiar phenomenon of a bog on a distinct slope, and so spongy, that one readily sank to one's boot-tops in water. Here and there, over the whole of this bog area, *Papilio machaon* might be occasionally seen, reminding one of the species at Wicken, but hardly common it would appear.

Such were our impressions of the first sight of a "*tiphon*" bog, a wide upland morass, covered with wild flowers that produced much besides *C. tiphon*. The character of the bog resembled that where *C. tiphon* seems always to occur, but the surrounding country brought such a wealth of insects into its near neighbourhood that one can hardly separate its fauna from that of the surrounding woods, meadows and orchards, and its comparative narrowness made it no barrier to the ready passage of the butterflies from the one side to the other, whilst the abundance of flowers attracted and kept many a passer-by. Hence one found *Leptidia sinapis*, with the three common Pierids. *Colias edusa* and *C. hyale* fly over, only staying to visit the flowers, but *Pieris rapae* and *P. napi* both abound, whilst *Gonepteryx rhamni* is quite at home everywhere, except on the absolutely wet-areas; *Enodia hyperanthus* swarmed beyond any species that may be considered a true "bog" inhabitant, whilst worn *Augiades sylvanus* and *Adopaea flava* were equally distributed, although newly-emerged *Thymelicus acteon* were only to be found on the drier edges, leading to the open slopes that stretch up into the woods. Similarly, as already noted, *Cyaniris semiargus*, of large size, appeared to be as much at home in the wet parts of the bog as did *Lycaena alcon*, whilst *Polyommatus icarus* also maintained its position there, but, perhaps, rather as a border-species than otherwise, a term which also might be applied to *Coenon-*

ympha pamphilus. We have already referred to the abundance of dragonflies here, and their lovely appearance in the hot sun. The diptera were not one whit behind. In the hot sun two or three species, with vicious habits, persecuted us terribly, causing a vile rash over the neck and hands, and from which we were not properly free until our holidays were over. Why are there not more dipterists, and why do those who do exist not want very long series of common species? At any rate they might devise some means of exterminating some of these brutes, even if they do not set about it as the lepidopterists exterminated *Apatura iris* and *Melitaea athalia* in Chattenden.

On the morning of July 28th we crossed the Lake of Zürich by a morning boat to Wädenswil and took train for Einsiedeln. This journey was largely to be in the way of spying out the land. Everywhere along the rail one saw on either side large stretches of bog-land, similar to that worked on the previous day, sometimes more isolated, at others with woods and meadows stretching down to its very edges. No doubt the whole of the country is good *C. tiphon* country, and produces all the special insects of the bogs. At Einsiedeln we "did" the church as recommended, and lunched, and then set ourselves to look round. The immediate neighbourhood of the town appeared to hold nothing more than *Dryas paphia*, *Brenthis amathusia*, *Enodia hyperanthus*, and *Erebia ligea*, at least we noted nothing more, so we walked through the town and made for some "boggy" ground on the way to Biberbrücke. The ground was very like that we had worked the preceding day, but much more isolated, the woods not coming down to its edge except at one point, and the remainder stretching away to the mountain-pastures beyond. Besides, it was a good 1200ft higher, for whereas the Stäfa bog is not more than 1700ft. elevation, Einsiedeln is 2900ft. The fauna, therefore, was especially a bog one, and not at all mixed with that from the surrounding districts with different geological and general characteristics. Most of the true bog insects of the Stäfa bog were here—*Coenonympha tiphon*, *Lycaena alcon*, *Melitaea dictynna*, *Crambus sylbellus*, *C. margaritellus*, *C. selasellus*, etc., whilst *Enodia hyperanthus* and *F. ianira* were both exceedingly common, and *Pieris napi* generally distributed, but the most striking additions, not noticed the preceding day, were *Brenthis ino* and *Lycaena arcas*, the former in considerable abundance, but worn, the latter more sparingly and the ♂s and ♀s also quite beyond their first beauty. Still it was new to me on the wing, and I was glad to see its quick *arion*-like flight, and its sooty ♀s were easily recognisable, apart from the deep brown underside. *Argynnis aglaia* was also frequent as well as *Coenonympha pamphilus*, *Adopaea flava*, *Agriades sylvanus* and *Leptidia sinapis*. The form of *C. tiphon* was identical with that captured at Staefa, but the specimens, although taken some 1200ft. higher were more wasted, a suggestion of different local conditions which one did not readily grasp, except that at Einsiedeln the bog forms a wide open space on which the sun shines all day.

Off the bog, and on the way to Biberbrücke, lots of interesting places were observed, well worth working no doubt, and, in one place several *Dryas paphia* on the wing formed an interesting picture. *Lycaena arion*, worn, *Erebia aethiops*, and *Erebia ligea* were observed on the slopes that ascend from the edge of the bog, with one ♂ *Agriades corydon*, the only one seen in the district, the species evidently not yet out, and

other common species noted, of which no record was unfortunately kept. On the pastures *Adkinia coprodactyla* was observed, and no doubt the country would be well-worth working seriously. Already in Wheeler's *Butts. of Switzerland* several good species are recorded from Einsiedeln, and certainly there is much to be done there. Our collectors who know all there is to know of the lateral branches of the Rhone Valley, and are interested in working new ground, and would like a change, might do much worse than spend a few days on the "bogs" between Wädenswil and Einsiedeln.

Myrmecophilous Notes for 1908.

By H. St. J. K. DONISTHORPE, F.Z.S., F.E.S.

FORMICIDÆ.—*Formica rufa*, L.—In September I found a nest of this species at Nethy Bridge, Invernessshire, which contained a large proportion of pseudogynes. This shows that *Atemeles pubicollis*, Bris., a species of coleoptera new to Britain, is to be found in Scotland. I also found pseudogynes in another nest in quite a different part of the forests at Nethy Bridge. This is the first record in Britain of pseudogynes of *F. rufa*. I shall, if possible, go to Nethy Bridge next spring to hunt for the *Atemeles*, as in the winter it would be in *Myrmica* nests.

Formica sanguinea, Ltr.—In May I found pseudogynes in plenty in a nest of this species in the New Forest. This shows that *Lomechusa strumosa* is to be found in the New Forest. It was the first time that pseudogynes of this ant had been taken in Britain.

Formica fusca, Ltr.—On October 25th I observed a specimen of this ant carrying an *Aphis* to its nest at Luccombe Chine, I. of W. I captured both, the *Aphis* was in no way hurt. This spot, by the way, is the only one in the I. of Wight where I know *F. fusca* to occur (though, no doubt it does occur in other parts of the island), *F. rufibarbis* var. *fusco-rufibarbis* being the form I have always found at Sandown and other places.

Formica rufibarbis, F.—When at Bewdley, in May, I found a fine nest of this species, all the ants being a very bright red. The nest was partly under a stone and partly built up in the bank. Mr. Arnold has taken this form at Ripley.

Formica rufibarbis var. *fusco-rufibarbis*, For.—My friend, Mr. Keys, of Plymouth, sent me the contents of some nests of this variety from his district, in which some of the pupæ were naked, as in *Myrmica* species. When at Sandown, I. of W., I found a nest of *fusco-rufibarbis*, which also contained naked pupæ, as well as pupæ in cocoons.

When digging at Luccombe Chine, on October 28th, many dealated ♀s of *Lasius*, sp. (*niger* or *flavus*) were dug up in the little cells they had formed, and with eggs, the nucleus, if successful, of future colonies. The ♀ is nine months without food, bringing up the first batch of ♂s. In one instance a couple of ♀s were found together in the same cell with a batch of eggs, and I pointed them out to my companions, Professor Beare and Mr. J. Taylor. On this subject Professor Wheeler writes*—" . . . attention has been repeatedly called

* "On the Founding of Colonies by Queen Ants," *Bull. American Mus. Nat. Hist.*, vol. xxii., 1906, p. 41.

to the fact that an ant colony is started by a single isolated female. This requires some qualification, since, under very exceptional circumstances, a couple of females from the same maternal nest may meet after their marriage flight and together start a colony. During August, 1904, I found two dealated females of *Lasius brevicornis* occupying a small cavity under a clump of moss on a large boulder near Colebrook, Connecticut. They had a few larvæ and small cocoons and a couple of tiny callow workers. . . . Without doubt these twin females were sisters that had accidentally met under the same bit of moss and had renewed the friendly relations in which they had lived before taking their nuptial flight. This case is of considerable interest because, as a rule, even sister ants seem averse to such post-nuptial partnerships."

Tapinoma erraticum, Ltr.—Several nests were found in the New Forest in May. They contained two or three dealated ♀s, but no beetles or other guests were found in them.

Leptothorax nylanderii, Först.—A small nest of this little ant was found in a broken bough on an ash-tree at Ryde, I. of W., in September. The ants were occupying the burrows of *Priobium castaneum*.

Solenopsis fugax, Ltr.—A fair number of specimens of this small species was found at Blackgang Chine in August. They were at the roots of *Arenaria maritima*, some alone and others with *Lasius niger* and *flavus*.

MYRMECOCHORUS SEEDS.—In a very interesting paper* on the "Dispersal of Seeds by Ants," Professor F. E. Weiss calls attention to the fact that ants may be of considerable importance in the dispersal of plants. He regards it from a botanist's rather than a zoologist's point of view, but in any case the subject is of great interest and will bear further investigation. All true myrmecochorus seeds provide a food largely of an oily nature, which attracts the ants. At Darenth Wood I observed ants from a nest of *Lasius fuliginosus* carrying seeds, unfortunately those I collected were lost; but on July 21st I made a small collection of seeds from a nest of *F. rufa* at Chattenden. The seeds were obtained by taking them from the ants as they arrived at their nests with them. Professor Weiss has kindly named them for me.

Iola, sp?—Several seeds. These are true myrmecochorus seeds and possess an appendage, the elaiosome, which contains the supply of oil sought after by ants.

Carduus sp.?—A thistle down. "Several species of thistle are provided with an elaiosome at the base of the style just inside the plume, so that when the latter breaks away, the food-body is exposed in the form of what French writers have called the 'mamelon.' This contains a plentiful supply of oil." Other seeds taken from the ants were—*Arrhenatherum arenaceum*, false oat-grass, *Holcus lanatus*, soft-grass, and a flower of the scarlet pimpernel. As these do not supply any food it is difficult to suggest for what purpose the ants carry them into the nest.

COLEOPTERA.—*Dinarda dentata*, Gr., and *Lomechusa strumosa*, F.,

* "The Dispersal of Fruits and Seeds by Ants" (*The New Phytologist*, vol. vii., no. 1, 1908.

were bred in my *F. sanguinea* observation nest in some numbers in the beginning of the year, January to May.

Myrmedonia humeralis, Gr.—When staying with my friend, Mr. Willoughby Ellis, at Knowle, in May, this beetle was observed in the greatest profusion in the Haye Woods. Though, of course, it is common and widely-distributed, and everyone who has investigated ants' nests has found it, still I have never seen it before in anything like the numbers it occurred here. Near one large nest a cart-track went through the wood, and in this track the *Myrmedonia* occurred in every crack and under every dead leaf, and also many of its larva. Every here and there little heaps of dead ants were to be found, and these kept being added to by the *Myrmedonias* with specimens they had slain. The beetles could be seen hiding and pouncing on a solitary ant. Thousands of the ants must have been killed in this way. I made some notes on June 2nd of an ant in captivity killed by a *Myrmedonia*. The latter started the attack at 10 a.m., and at 11.55 it had bitten the ant's head off and taken it into a corner to be devoured. It bit at the ant all over, and when the ant was roused it always poked the tail into the ant's face. When other *Myrmedonias* tried to join in, it pushed them off with its tail. This specimen was a ♀, as a ♂ tried to copulate with it at 11.15. This it did not allow, but I was able to observe the copulation in other couples. Copulation takes place in the same way as I described* in *Lomechusa*, that is, the ♂ does not get on the back of the ♀, but bends the tail over the body and head to reach the end of the tail of the ♀.

I had hoped to solve, with the help of Mr. Grosvenor, of the Oxford Museum, the problem I have been working at for a good many years now, namely, what is the chemical formula of the substance given off by *Myrmedonia* to protect itself from the ants? We took some of the beetles round to all the chemists at the Museum, but they were none of them able to recognise what the very strong pungent smell is that *Myrmedonia* excretes. Altogether our experiments can only be described as negative, chiefly on account of not having enough beetles with me. (This was a great pity, as at the time I might easily have obtained a very large quantity instead of the 60 or 70 I took away. My friend, Mr. Ellis, seemed to think it would prevent them occurring another year. With this I personally disagree, as when a beetle occurs in such numbers one can make very little difference by a single day's collecting.) Still, it may be as well to record here what they consisted of. A flask containing the beetles, with a tube to let air in, was connected with two large glass test-tubes, in which we tried water, alcohol (dilute and absolute), and cotton-seed oil, for absorbing "smell." A suction pump being fitted to the last tube to draw the air from the "beetle flask" through the two test tubes.

Homolota parallela, Man.—This little species was observed by Professor Beare and myself with *F. rufa* at Nethy Bridge.

Bythinus glabratus, Rye.—Mr. W. H. Bennett captured it this year with its usual ant, *Ponera contracta*.

Coccinella distincta, Fald.—On May 31st, at Bewdley, I pointed out specimens of this "lady-bird" to my friend, Mr. Ellis, which were crawling out of a nest of *Formica rufa*, and we subsequently found a

* *Trans. Ent. Soc. Lond.*, 1907, pt. iv., p. 416.

good number. This is its first record for the Midlands. My present view is that these beetles seek the nests of *Formica rufa* for hybernation, and leave in the spring or early summer.

Dendrophilus pygmaeus, L., and *Monotoma conicicollis*, Aub.—Specimens were found by Professor Beare and myself in *F. rufa* nests at Nethy Bridge, in September.

PEZOMACHIDÆ.—*Pezomachus anthracinus*, Först.—On June 21st I found a number of specimens running about in company with *Lasius niger*, on the Deal sand-hills, and looking very ant-like in appearance.

Pezomachus aquisgranensis var. *neesii*.—I took a specimen in a nest of *Myrmica laevinodis*, at Sandown, I. of W., on August 26th. Morley records the type with *Myrmica ruginodis* and *scabrinodis* in the Bentley Woods, Suffolk.

BRACONIDÆ.—*Chorebus* sp.?—I bred a ♂ (March 17th, 1908) and a ♀ (March 27th, 1908) out of my observation-nest of *F. rufa*.

Apanteles falcatus, Nees.—I bred a small ♀ in my *F. rufa* observation-nest in July. I understand the genus *Apanteles* is parasitic on lepidopterous larvæ, and I have, of course, introduced such larvæ into my nest as food for the ants from time to time.

Acoelius viator, Först.—On September 18th I took a specimen of this rare species in a nest of *Formica rufa* at Nethy Bridge, Inverness-shire. I understand from Mr. Morley that only one other specimen is known, the type, which was taken at Aix-la-Chapelle.

CHALCIDIDÆ.—*Spalangia erythromera*, Först.—The little black *Spalangia* which I have recorded before from *L. fuliginosus* nests at Wellington College, and bred in numbers from my observation-nest of that species, have been named for me by Professor Howard, as above, and confirmed by Father Wasmann, who has taken it with the same ant.

(To be continued.)

The Sale of the Collection of Lepidoptera formed by the late Mr. W. H. E. Thornthwaite.

The death of Mr. Thornthwaite found his collection in a very upset condition. He had recently bought two large Gurney cabinets, whilst another was being built, the collection had been turned into boxes for rearrangement, and everything was upside down. It took a considerable time merely to place the specimens in the cabinets ready for the sale, which took place in "Stevens' sale rooms" on October 27th, and this want of arrangement and the fact that some of the insects were not too well-labelled, all told in producing a comparatively poor financial total. Yet most things that were really good sold well. A pair of *Cyaniris semiargus* from the "Fry coll." went for 26s.; a poor ♂ *Chrysophanus dispar*, 32s. 6d., and a fair ♀, 45s. A *Eucanessa antiopa*, with a "Hackney" label, brought 11s., whilst a lot, with a good aberration of *Argynnis adippe*, produced 20s.; and a magnificent specimen of *Enodia hyperanthus* ab. *lanceolata*, with three aberrations of *Epinephele ianira*, produced 50s. These were the best prices for the butterflies. A really beautiful series of *Agrius convolvuli* and two *Hyloicus pinastri* produced 30s.; five *Celerio gallii* (Dr. Gill), a *Hyles euphorbiae*, labelled "Bouchard," and a *Hippotion celerio*, from "Lynmouth," produced 11s. only, whilst three *Phryxus livornica*, one from

"Harper's" and two from "Shepherd's" sales, went for 8s. A series of eleven *Egeria scoliaeformis*, etc., produced 16s., and the rest of the Sesiids, 15s.; one suspects that the rapidity with which these insects deteriorate has much to do with the maintenance of a high price. The presence of a poor pair of *Laelia coenosa* raised "lots 60 and 61" to 14s., whilst two *Epicnaptera ilicifolia*, "bred by Wheeler," went for 42s. Two *Cerura bicuspis*, "Tester, 1874," raised another "lot" to 13s., and eight *Petasia nubeculosa*, the succeeding lot, to 12s. The Noctuids varied much in price. Lots of nine and ten *Hyboma strigosa* produced 25s. and 26s. respectively, the rest of the Acronyctas fetching 18s. only, although containing five *Jochaeara alni* and five *Phaertra auricoma*. Lot 77, however, with a fine *Leucania extranea* from "Devonport," brought £3 7s. 6d., and another lot of "Wainscots," containing four *Leucania obsoleta*, etc., 14s., in fact all the "Wainscots" fetched good prices. Lot 88, with three *Xylomiges conspicillaris*, produced 20s., and a fine *Crymodes exulis* 15s. The presence of a *Dianthoecia compta*, labelled "Howth, 1896," and two *Luperina barrettii*, raised lot 100 to 22s.; one hopes the buyer did not think the *D. compta* British, as the insect has not, we believe, the slightest claim on our fauna. The sale of fine *Polia xanthomista*, *P. var. olivacea*, *Dasyptolia templi*, *Epunda lichenea*, and *E. lutulenta*, at about 1d. apiece is very sad, but the presence of an old specimen of *Hydrilla alustris*, without data, brought up lot 108 to 25s. A good pair of *Agrotis subrosea*, "Meek's Coll.," produced 63s., and seven fine *Pachnobia alpina*, 18s., but seven others produced only 6s. A specimen of *Noctua flammatrix*, taken at Norwich, July 10th, 1875 (*Ent.*, ix. p. 18), produced 70s., and a huge lot of Orthosiids, containing one *Orrhodia erythrocephala*, "Brighton," and eleven *Dasyampa rubiginea*, fetched 23s. Some nice *Xylina semibrunnea* brought lots 135 and 136 up to 16s., and ten *Heliothis armigera* and ten *H. peltigera* caused lot 138 to bring in 21s. The historic specimen of *Heliothis scutosa*, taken at Cromer lighthouse, was sold at £3 12s. 6d., and a *Micra ostrina*, from the "Tugwell coll.," for 22s. The Geometrids fetched relatively poor prices, and the payment of £3 for a specimen of *Boletobia fuliginaria*, "bred by A. Noakes, Lewisham, 1882," was surely a blunder. The history of these Noakes-bred *B. fuliginaria* was commented on, we believe, in *The Entom.* at the time. A lot of lovely bred *Eupithecia jasionvata* and *E. helveticaria* went for 10s., but, on the whole, the "pugs," correctly named and in good condition, hardly fetched 1d. apiece. Two other lots, containing two and four specimens of *Phibalapteryx polygrammata*, produced 18s. and 21s. respectively. These were the chief prices produced at the sale, which evidently offered numerous opportunities among the less rare species for bargain-hunters.

Two cabinets only were offered for sale. The "Gurney" cabinets had been bought privately before the sale. We understand also that the Micro-Lepidoptera are to be merged in Mr. Tutt's collection.

Harpalus cupreus, Dj., in the Isle of Wight.

By HORACE ST. J. K. DONISTHORPE, F.Z.S., F.E.S.

This fine beetle has once more turned up in the Isle of Wight after not being taken in any numbers for 20 years. I have been looking for it myself for the last 15 years without success. In October last,

Mr. J. Taylor sent me some specimens alive which he had taken under stones in a field near Sandown, and which he thought must be *cupreus*. I went down to investigate, but we found the beetle very sparingly. Mr. C. J. C. Pool suggested (as no more could be found under stones) digging for the species, as he had found that a very good plan to get vars. of *aeneus*, and by this means *cupreus* was found in numbers. Over 80 specimens were taken by Beare, Mitford, Pool, Taylor, and myself. The history of the beetle as British appears to be as follows: Stephens recorded it from a single specimen said to have been taken near London on the banks of the Thames (this is probably incorrect, as the species has never been found in Britain since, except in the Isle of Wight, and like several other south European species, is peculiar to the Island, such as *Cryptocephalus bipunctatus*, type form, *Baris analis*, *Cathormiocerus socius*, etc.). Dawson recorded that it was very rare in Britain, and that he only found it at Ryde, Cowes, and Sandown, in the Isle of Wight. Fowler gives these same three localities and mentions that Mr. Horner took it not long ago at Sandown. In July, 1888, Champion recorded it as plentiful beneath stones on the margin of a cornfield at Sandown. In 1897 Lloyd found it very scarce and sparingly in the same spot. In 1898, Champion could not find it again. In May, 1899, Ellis took one specimen under a stone at Bembridge. In August, 1900, Taylor took a very fine ♀ with all red legs and antennæ at Alverstone. This most unfortunately was named *aeneus* for him by the authority he sent it to, and has been seen since by another so-called authority; it very naturally much discouraged him, as he had made it out to be *cupreus* himself. However, he has the consolation of turning the beetle up again now, and Pool is to be congratulated on the great success of his plan. Ganglbauer gives the whole of south Europe for its distribution, and the last European Catalogue—Mediterranean; France, west; Britain; and Caucasus.

Nonagria edelsteni, Tutt.—A Noctuid New to the British List.

By J. W. TUTT, F.E.S.

It is most interesting to have a new British Noctuid to chronicle, especially a species about which so much doubt and uncertainty have been rife. Only so recently as July last (*Ent. Rec.*, xx., pp. 164 *et seq.*). I drew attention to this insect and its ally, *N. neurica*, Hb., and pointed out that Mr. Edelsten agreed with Schmidt and Staudinger that there were two allied species on the Continent of Europe characterised as—

Collar white.
Central streak blackish, containing three white dots, the outer one forming the central spot.
Underside quite plain, with no markings.

Collar same colour as body.
Central streak blackish, no white dots, central spot black, encircled, or partly so, with white.
Underside showing the central spots and marginal lunules.

—and which he called respectively *neurica*, Hb., and *arundineta*, Schmidt. I further pointed out that Hübner's fig. 381 (the typical figure of *neurica*) failed in all these characters, (1) the collar is not white, (2) the central streak does not contain three white dots, (3) the underside is not shown, and, therefore, the insect with these characters does not

agree with the figure of Hübner. On the other hand, I observed that, in Hübner's figure, the collar is (1) of the same colour as the body, (2) the central blackish spot (the lower part of the reniform) is encircled with whitish, and that, on these characters, the figure must be held to coincide with what Schmidt called *arundineta*, and not with what he unfortunately called *neurica* (see pl. xxi., figs. 6-9), where this character is well shown. The comparison of Hübner's fig. 381 with Edelsten's summaries of the descriptions of Schmidt's two species, clearly shows that—

Neurica, Hb., fig. 381 = *arundineta*, Schmidt—

whilst *neurica*, Schmidt, is, on the characters given, a distinct species (I long ago considered, probably only a variety) which I named, in July last, *edelsteni*. It is this latter species, with (1) white collar, (2) three white dots placed longitudinally, (3) with unspotted underside, which has lately been added to our fauna by Messrs. Wightman and Sharp, who captured a large number of examples in the Cuckmere Valley of Sussex, on July 22nd; *Nonagria neurica*, Hb., having been added to the British list by Bond in 1845 (*Zoologist*, 1845, p. 1881).

Assuming Schmidt to be the first author to really differentiate the species, we append from Edelsten (*Ent. Rec.*, xix., p. 34), the translation of that part of Schmidt's description, that applies to this species. Erroneously assuming that *neurica*, Hb. (fig. 381), differed from *neurica*, Hch.-Sch. (figs. 347, 348), both as seen from the figures really being referable to the species with the dark lower half of the reniform pale-ringed, an error for which Schmidt may certainly be fairly excused, as he himself observes—

"I cannot compare Hübner's illustration for the present; I have seen it but once, and only remember to have recognised by it by my first variety. Herrich-Schäffer's successful illustrations decidedly represent my second variety—*arundineta*"—

He writes of the two forms as follows (*Stett. Ent. Ztg.*, xix., pp. 367-370):—

Although the two forms are very similar to each other, yet they are, in many respects, stable, and so different that I am, for instance, never in doubt as to which of the two forms the specimen belongs. Both forms vary considerably in colour, and in a similar way; but the former does not do so to the same extent or so frequently as the latter. The size, shape of the wings, and markings are almost the same in both. The difference in colour and markings is not so noticeable as is the much weaker build of the body in Hübner's form* compared with mine †, although the length of the body and the size of the wings may be the same in both forms. This is more strikingly shown in living specimens than in dried ones. The first form has a white-bordered collar, and the latter† an unicolorous one. The wings appear wider in the former,* and the ground colour of the forewing is usually yellowish reed-coloured; in the latter form † it is, on the whole, darker—greyish, brownish, reddish, and yellowish, in stronger gradations. The males, especially, differ in having the dark longitudinal stripe, in the middle of the forewing much weaker in the former variety,* and the spots in it are only indicated below by a pair of white points, while the longitudinal shade is stronger in the second variety,† and the reniform is generally quite visible. Furthermore, the underside of the latter† form is distinguished by a sharp and stable central lunule on all wings, as well as by some marginal marks, as against the former,* which has no mark here except the arched line. The former variety,* appears some three to four weeks before the latter,† and flies singly about reeds in the evening in several localities. Although not scarce in some localities, the other† is only to be found in two localities situated near one another, and most frequently occurs here, as a larva, together with that of *paludicola*. But their number has of late been smaller there year by

* i.e., our *edelsteni*.

† i.e., *arundineta*, Schmidt (= *neurica*, Hb.).

year, while the former form* seems to have multiplied and spread in the same proportion. Their flight, too, is essentially different. While the former variety* flies easily and more slowly, the other one shoots away with more powerful flight, almost like *paludicola* and *nexa*. I have bred Herrich-Schäffer's form† for several years, and also communicated special facts about their habits, which correspond in their essential parts with Treitschke's statement, and in my addendum to "Uebersicht Mecklenb. Lepidop." (*Archives of the Society of Friends of Natural History in Mecklenburg*, v., pp. 137 et seq.). On the other hand I have, so far, obtained Hübner's variety* almost exclusively by catching, and only lately observed it more closely, and have only bred it singly from the pupa. As regards its larva, which I am certain I have often seen, although I am not certain of having bred the moth from it, I beg to point out that I scarcely noticed any difference between the two in their way of living, and in their general build, except that they appeared considerably earlier, and were always met with singly in other localities. Also, after very closely examining two pupæ found here a few years ago, I did not notice that they differed from the more robust variety except that they appeared somewhat thinner and more greenish-yellow, and were also lying in the reed-stem somewhat higher from the ground (some widths of the hand above the water) than seems to be the rule with the others. From one of these pupæ a fine ♀ of the first variety* emerged very late in the season**, and, at the same time a ♂ of the other species† appeared. I availed myself of this fortuitous event, which I had long desired, to try whether the two varieties would copulate, which I always noticed took place in the case of the more robust variety†, as soon as both sexes were together in the receptacle, and mostly immediately after development. Being placed together, they did not appear to be inclined that way, although they were flying together for two evenings. Now what especially confirmed my belief that the two were different species, was when, on the third evening, a ♀ of the second variety† came out, with which the ♂ copulated at once. From all this, I think I am entitled to the assumption that the two varieties referred to, previously united as *neurica*, are two different species, even if, on closer examination, their larvæ and pupæ should not visibly show much difference. The name *neurica* must remain with the older Hübnerian variety, and the other, Herrich-Schäffer's variety, must, therefore, have a new name. As this one occurs deeper in the reed-bed, more in the thicket of it, I call it *arundineta*.

It is unfortunate that, neither Schmidt nor Herrich-Schäffer, to whom Schmidt says that he submitted specimens, observed that Hübner's fig. 381, was wanting in the characters—"white collar," "white dots along centre of wing," and "unspotted underside" which were insisted on by Schmidt (and so clearly designated in *edelsteni*, see pl. xxi., figs. 1-5). and that, therefore, the really new species was not *neurica*, Hb., but that both *neurica*, Hb., and *neurica*, H.-Sch., had got the collar coloured uniformly with the thorax, and the dark lower part of reniform pale-ringed (see pl. xxi., figs. 6-9), and that both were the same species which Schmidt renamed *arundineta*.

It has been suggested that this description of Schmidt's is not the earliest referable to our newly-discovered (in Britain) and recently-named *edelsteni*, and that a remark in that part of Treitschke's description of *neurica*, Hb., in which he refers to *dissoluta* (*Die Schmett. von Europa*, v., pt. 2, p. 319) involves an earlier description. Treitschke heads his species:

NEURICA.

Non. alis anticis flavo vel fusco ferrugineis, vena maculaque medio albicantibus, serie punctorum nigrorum ad marginem externum.

Hübner, "Noct.," tab. 82, fig. 381 (♂).

Hübner, "Noct.," tab. 144, figs. 659-660 (♂), fig. 661 (♀) *N. neurica*.

* i.e., *edelsteni*, Tutt. † i.e., *neurica*, Hb.

** This fact suggests, in comparison with the earlier statement that *edelsteni* occurs some three or four weeks earlier than *neurica*, that there is some overlapping as one might suppose.

This description can leave no manner of doubt that this belongs to *neurica*, Hb., 381, and *arundineta*, Schmidt. He then goes on to say (*op. cit.*):

Ochsenheimer has referred to Hübner's *neurica* on p. 82 of his *Entwurf*, and understood by it the reed-coloured form without marks on the underside, of which there were a few examples in Mazzola's and his own collections under this name, and which came from the Rhine district.

Now one might suppose from this that Ochsenheimer had written somewhere the suggestion in this paragraph, but, on referring to the *Entwurf*, p. 82, one finds that all Ochsenheimer chronicles is as follows:

Genus lxviii: NONAGRIA.

Uvae, O. nov. sp.

Fulva, Hüb. mas (*Extrema*, Hüb., foem.).

Phragmitidis, Hüb. (*Semicans*, Esp.).

Neurica, Hüb.

Sparganii, Hüb., Esp., Borkh.

The observation, therefore, is merely Treitschke's, and, being made some nine years after Ochsenheimer's death, is a mere expression of opinion of the latter's view of the insects being dealt with at the time, based on a conversation, specimens exchanged, specimens in a collection, or something similar, and Treitschke may, or may not, be referring to our *edelsteni*, as he mentions none of the characters relied on by Schmidt later, except "the unspotted underside," which, unfortunately, can never be taken into account in considering Hübner's figure as it does not show it, and which, at any rate, whatever its value, is stultified as an opinion of Treitschke's, by the latter's diagnosis of *neurica* (*suprà*), and further description (*infra*) which clearly refer to *arundineta*, Schmidt. Treitschke (*op. cit.*) then goes on to say—

Later, we received from thence some very much darker moths, marked on the underside, under the name *N. dissoluta*. They agreed exactly with Hübner's figs. 659-661. It therefore seemed certain that Hübner had repeated the name *neurica* by mistake, whereas *dissoluta* should have been given instead.

This is the first reference to *dissoluta*, and clearly refers wholly and solely to the dark aberrations of *N. neurica*, Hb., figs. 659-661, and has nothing to do with the newly-named species. Continuing, he notes (*op. cit.*)—

Further consignments have, since then, conclusively proved that Hübner was right to call all the forms *neurica*, whether marked above, dark or light, and underneath with or without black markings; all are connected by the slightest gradations, and, furthermore, it confirmed what had already been said about the variability of this plain-looking creature. *Neurica* varies in tone from reed-coloured to the deepest yellowish dark-brown, as do also *paludicola* (*geminipuncta*), *typhae*, and others. The head and thorax are coloured like the forewings, the abdomen is lighter, inclining towards grey, that of the ♂ especially long and slender, with yellowish-brown anal tuft. The antennæ are bright yellow, fine, serrate in the ♂. Legs brown-yellow. The forewings are short, broad, pointed at the apex. They vary as mentioned, so much so that the intermediate form connecting the two varieties has lighter and darker parts. On all which are not quite without marks, the broad outer margin is the lightest, and without the black specks which irregularly cover the other parts. The median vein is white longitudinally, bordered with black. Beyond the middle of the wing is a black dot with white bordering which is sometimes formed like a figure 3, very rarely with no margin. Before the outer margin a more or less defined double row of dots crosses the vein; there are two dots next to the inner margin, and there is a row of black and white streaks in the other part of the shaded band where the wings usually become darkest as far as the fringes. These are bordered with clear black dots, otherwise lighter than the ground colour and simple. The hindwings are yellowish-white towards the base, more or less dusted with grey posteriorly, with the lunules

and smaller lunular marks as a border to the whitish fringes. The underside is yellowish, grey dusted, sometimes unmarked, sometimes with central spots and dots before the fringes, often also with a curved line and a shade almost forming a band before it. The larva is dirty-white with pale red back, lives in the interior of the reeds, and changes in June or July to a pupa, head downwards. The moth appears in four weeks (according to information from Herr Hess, of Darmstadt). In mode of living and changing it resembles the following species, *paludicola* (*geminipuncta*). I only know the district of Darmstadt as its habitat, and there the moth is rather rare.

This long statement refers to *neurica*, Hb., as Treitschke understood it, and he states clearly that his *neurica* varies in tone from reed-colour to the deepest yellowish dark-brown, as do also *paludicola*, *typhae* and others," a fact we know to be true of *neurica*, Hb. (= *arundineta*, Schmidt), but of which we have no evidence up to the present moment of *edelsteni* (i.e., *neurica*, Schmidt), although some ♂s are heavily dusted with blackish. There may be in Treitschke's long statement a suspicion that he may have had *edelsteni* mixed with his *neurica*, but the main features of his general description, like his Latin diagnosis, are applicable only to the latter, and his larval description distinctly refers to *neurica*, Hb. = *arundineta*, Schmidt. Duponchel in 1840, and Herrich-Schäffer in 1845, refer the species we know as *neurica*, Hb., correctly to *neurica*, and Boisduval, in 1840, certainly does the same, although he queries whether the dark form of *neurica* is specifically identical with the pale form of the same species, and describes the dark form Hb. 659 (already referred to by Treitschke as *dissoluta*), and renames it *hessii*, Bdv. He wrote:—

"No. 1081. *Hessii*, Boisd. (an var. *neuricae*?). *Neurica*, Hb., 659. Alæ anticæ nigro-fuscae, macula reniformi albida, intus fusca; alæ posticæ pallidæ. Dom. Hess, qui abunde Nonagrias circa Darmstadt educit, mihi ut variet *neurica* hanc speciem misit. Dom. Treitschke quoque in synonymia ad *neuricam* genuinam refert. An rite?"

Herrich-Schäffer, whilst rightly complaining of the poorness of Hübner's figures, had no doubt about the species, and his descriptions speak for themselves:—

"No. 189. *Neurica* Hb. 381.—Totally defective in its outlines, forewings much too large. Fusco-testacea loco stigmatis reniformis annulo albo, fusco repleto. Hindmargin with sharply marked black lunules between the nervures, the outer transverse line indicated by black dots which are shown up by white on both sides. Dark reed-colour, a longitudinal darker ray through the middle of the forewing, before this, towards the costa, some black dots, two indicating the position of the central spot, the third indicating the inner boundary of the front half of the reniform. Hindwings lighter, without markings. Around Darmstadt, August."

"No. 187. *Hessii*, Boisd.; *neurica*, Hb. 659-61.—Much too robust, outline of the forewings defective. Fuscoferruginea, stigmata reniformi versus limbum et marginem interiore albocincto. Differs from *neurica* in appearance only by the reddish-brown colour of the forewings. The central spot extending more towards the outer margin, its form seems more like the usual reniform, the three dots, however, on its outer border are missing. Darmstadt."

The description of the reniform in Herrich-Schäffer's examples, "surrounded by whitish, filled in by fuscous," agrees with Hübner's figure, and is the exact opposite to that of *edelsteni*, which is "surrounded with dark, filled in by white." Besides, the whole of the remainder of the descriptions refers unquestionably to *neurica*, Hb. = *arundineta*, Schmidt, as also do the descriptions of Guenée (1852), and Stainton (1857).

So far then, and up to 1858, when Schmidt discriminated the two insects, in the account given in the commencement of this paper, there had been no suspicion of two species being included under the name except

that the ordinary form and the dark form had been noted separately, and the latter had been referred to in 1825 as *dissoluta* by Treitschke, and *hessii* by Boisduval and Herrich-Schäffer.

It is true that Treitschke notes, nine years after Ochsenheimer's death, that Ochsenheimer considered specimens "without marks on the underside" to be *neurica*, Hb. It is clear that the point can prove nothing scientific, as Hübner's figure shows no underside, and, in science, what Treitschke says "Ochsenheimer considered," surely cannot carry any weight, as Ochsenheimer himself writes nothing, publishes nothing, on the matter, and, if Ochsenheimer did consider an insect, "without marks on the underside," to be Hübner's *neurica*, it still remains the fact that the upperside of Hübner's figure carries none of the characteristic marks of *edelsteni*, having neither a "white collar," nor "the white spots along the centre of the wing," most constant features of all the examples captured by Messrs. Wightman and Sharp, as well as those figured by Edelsten (pl. xxi., figs. 1-4). Much stress has been laid on the fact that, in 1869, Staudinger (*Stett. Ent. Ztg.*, xxx., p. 88) wrote:—

In Ochsenheimer's collection there is a genuine *neurica*, Hb., fig. 381, designated as such by a label written with his own hand. Underneath a typical *arundineta*, Schmidt, is placed, and provided with a label, on which is the following, written in Ochsenheimer's handwriting: 'An eadem cum præcedente? sub nomine Noctua *dissoluta*.' In Treitschke's collection there are, under the label *neurica*, five specimens, the first of which is a *neurica*, Hb., 381, the second, third, and fourth are *arundineta*, Schmidt, and the fifth is a dark variety of *neurica*, Hb., figs. 659-661, subsequently, *hessii*, Boisd.

That is (allowing everything for what it has been said Staudinger meant and not what he wrote), 53 years after Ochsenheimer's death, there was a specimen of *edelsteni* (*neurica*, Schmidt), with a label on it in Ochsenheimer's handwriting (*teste* Staudinger), referring it to "*neurica*, Hb., fig. 381." Now for the purpose of science, one might ask many pertinent questions about a specimen in a man's collection 53 years after his death; one might also ask if this specimen was really *edelsteni*, whether it had the "white collar," and the "three white spots along the centre of the wing" after typical examples of *edelsteni* (= *neurica*, Schmidt), or the dark reniform surrounded by pale (= *arundineta*, Schmidt), after the figure of Hübner, to which Staudinger refers it, and finally, one might then ask whether, if Ochsenheimer did really (by label) refer a specimen of *edelsteni*, with typical markings, that was in his collection, to *neurica*, Hb., and erroneously put on it a label which might be considered as expressing an opinion (but published nothing about it) whether it has anything whatever to do with our consideration of Hübner's figure? This latter is as available to us to-day as to all the entomological authors who rightly referred it to the species that Schmidt renamed *arundineta* (Treitschke, Duponchel, Boisduval, Herrich-Schäffer, Guenée, Stainton, etc.), and whose synonymy and conclusions, Schmidt, a collector, evidently without Hübner's work for reference, so thoroughly upset.

There are many points in my previous writings that I did not fully appreciate about *edelsteni* in the flesh, till I saw the very long series exhibited by Mr. Wightman recently at a recent meeting of the Ent. Soc. of London (I had previously only seen a single example shown me by Mr. Edelsten). But, through them all, I have consistently urged and been convinced that *neurica*, Hb., with the dark reniform,

ringed with pale, was *arundineta*, Schmidt. I have now shown that whatever Ochsenheimer may have thought about *neurica*, Hb., he published nothing, and that we cannot (for scientific purposes) deal with a man's thoughts 90 (or even 9) years after his death. I have also shown that Treitschke, even if he knew of *edelsteni*, combined it with *neurica*, and treated it as a variety thereof, certainly he never suggested that the species he diagnosed was not *neurica*, Hb.

We have, therefore, a long series of authors—Hübner (1802 and 1818), Treitschke (1825), Duponchel (1840), Boisduval (1840), Herrich-Schäffer (1845), Guenée (1852), and Stainton (1857), all figuring or describing an insect with dark reniform ringed with pale, complaining of the general colouring, etc., of Hübner's figure 381, but having no doubt about the species.

Then, in 1858, we have Schmidt referring our *edelsteni* to *neurica*, Hb., with the statement (already quoted): "I cannot compare Hübner's illustration for the present; I have seen it but once, and only remember to have recognised by it my first variety." This was the first real actual statement on specimens that was ever made in doubting that Hübner's figure did not represent the pale-encircled dark-reniform species, except the remark of Treitschke that Ochsenheimer "considered Hübner's fig. 381 to represent the unspotted-underside form," an opinion that Ochsenheimer certainly never put into words. The second statement in the same direction on actual specimens came from Staudinger (*Stett. Ent. Zeitg.*, xxx., p. 88) who asserted, 53 years after Ochsenheimer's death, that "Ochsenheimer had already correctly surmised the last-named [of (1) *neurica*, Hb., 381, (2) *arundineta*, Schmidt, (3) the dark variety of *neurica*, Hb., figs. 659-661], to be another species, viz., *arundineta*, Schmidt (see *Ent. Rec.*, xix., p. 56), which is just what it is. Staudinger further adds that there was in Ochsenheimer's collection one "genuine *neurica*, Hb., fig. 381," and in Treitschke's collection was "one *neurica* Hb., fig. 381," i.e., so far as we know until Schmidt obtained specimens—two examples only of what Staudinger (following Schmidt) calls "true *neurica*," and which we now consider to be *edelsteni*, although, even till the present moment, these specimens, of which so much has been made, appear never to have been described except as the "unspotted-underside variety."

The form with white collar, three white dots along central shade, and unspotted underside, therefore, never had been named, until we named it (*Ent. Rec.*, xx., p. 164).

It would be possible to waste much time and space in discussing probable meanings of many things written by entomologists (including ourselves), but there are only two questions that entomologists need ask who have to deal with the insects:—

(1) Does Hübner's fig. 381 represent an insect with dark reniform, edged with pale (= *arundineta*, Schmidt), or one with a white collar, and three white dots along the centre of the wing (= *edelsteni*, Tutt)?

(2) Can Treitschke's statement of what Ochsenheimer thought, or can the insects Staudinger found 53 years later in Ochsenheimer's collection have any scientific bearing on whether Hübner's fig. 381 should be referred to an insect with a white collar and three white spots along the centre of the wing (characters which it does not possess), or to one with a dark reniform with pale circumscription (which it does possess)?

Simple questions, like these, would appear to be capable of carrying simple answers, but it appears they are not. At any rate, "genuine" or "true" *neurica* of which we have heard so much, are those with "a dark reniform surrounded with pale" (*teste* Hübner's figure). They include all our former British specimens, those sent out from Hunts and Cambs as *neurica* (following Stainton), and those sent out from Norfolk, Essex, and elsewhere as *arundineta* (following Newman). Field lepidopterists want to know whether their specimens agree with the original figures and descriptions of the names they bear, and if they do not, are hardly likely to be satisfied with "an opinion" or "ipse dixit" that the species is so and so, backed up by reasoning on literature which does not affect the point at issue, or include a first-hand consideration of the original figure.

We are taking the liberty of again reproducing the plate which illustrated Mr. Edelsten's excellent article last year (*Ent. Rec.*, xix., nos. 1-3). We can only repeat that we appear to agree entirely with all Mr. Edelsten's quoted facts, we only disagree with his primary conclusion.

EXPLANATION OF PLATE XXI.

- | | | |
|------|------------------------------------------------------|---------------------------------------------------------|
| 1. | <i>Nonagria edelsteni</i> , Tutt. | ♂, taken by Schmidt. |
| 2. | " " | ♂, from Professor Stange. |
| 3-4. | " " | ♀, " " " " |
| 5. | " " | ♂ (underside), taken by Schmidt. |
| 6. | <i>Nonagria neurica</i> , Hb. | ♂, taken by Schmidt. |
| 7. | " " | ♀, " " " " |
| 8. | " " | ♂, from Norfolk Broads. |
| 9. | " " | ♀, from Central Asia. |
| 10. | " " | ♂ (underside), from Norfolk Broads (slightly enlarged). |
| 11. | Ova <i>in situ</i> of <i>Nonagria neurica</i> , Hb., | from Norfolk Broads. |
| 12. | " " " " " " | " " " " " " (× 15 diameters). |

Clambus punctulum, Beck., a British species.

By H. ST. J. K. DONISTHORPE, F.Z.S., F.E.S.

Clambus punctulum, Beck., was described and figured in the *Beiträge zur bayerischen Insektenfauna*, Augsburg, 1817, p. 8, plate i., fig. 4. The description reads:—"Ater, nitidus, subacuminatus, pedibus fulvis, elytris pilosellis. Black, shining; the legs gold-yellow, the elytra furnished with sparse, extremely delicate, little hairs. The head and thorax are very bent, the abdomen strongly acuminate. The outline of the body distinguishes it easily from *Herr Sturm's atomarius*" (= *C. armadillo*, de Geer). I captured a specimen at Chattenden, on July 21st, by evening sweeping in company with *Cyrtusa minuta* and *Anisotoma badia*. Fowler writes (*Col. Brit. Isles*, vol. iii., p. 12):—"A fourth species, *C. punctulum*, has been included in the British list, but has been dropped, as the specimens on which it was introduced appear to be only small *C. minutus*."

Ganglbauer refers (*Käfer von Mitteleuropa*, vol. iii., p. 259) to *punctulum* as follows:—"Comes very close to *minutus*, from which it is only distinguished by its smaller size. The differences given by Reitter in the length of the last joints of the antennæ (by *minutus* much longer, by *punctulum* as long as broad) I do not find confirmed. The colour is variable as in *minutus*. Long. 0.6mm.-0.7mm. Europe, Mediterranean. Rarer than *minutus*." He treats it as a good species.

The antennæ in my specimen are as described by Reitter, the last joints being much shorter than in my *minutus* from Scotland (Nethy Bridge), and in the Bates' collection. It is also much smaller. Fowler is wrong in saying that the elytra in *C. minutus* are entirely without pubescence, as, as pointed out by Ganglbauer, in quite fresh specimens very delicate sparse and short hairs are present. Crotch stated (*Ent.*, vol. iii., p. 120) that *punctulum* differs from its ally *C. minutus*, in being about half the size, and gradually attenuate behind. It is included in the British list in Crotch's *Catalogue*, 2nd edit., 1866, and Sharp's *Catalogue* of 1871.

Wicken re-visited.—The lepidoptera of Wicken Fen, etc.

By RUSSELL E. JAMES.

Wicken once again! There is an attraction about the fens, and Wicken in particular, that, after a few years' absence, creates an irresistible longing to return and revisit the old haunts, and collect the old species. I must confess that it is a "collector's" rather than a "scientist's" instinct that draws one, as the species are always more or less the same, and it would be difficult to discover much about their life-histories and habits that is unknown to the local professional collectors. But there is such a charm about the place itself. There are these professionals to begin with, their keenness and real love of nature being quite unspoiled by any taint of the "dealer spirit." Then the road leading to nowhere else (one cannot consider Upware "anywhere else"); the old-world village with its quaint greens and delightful villagers; perfect peacefulness of the fen itself at sunset, as the grassy lane opens out into the main drove, and *Nudaria senex* and *Coenobia rufa* begin to fly softly over the sedges. This is the thing that grips one—the peacefulness of it all.

Ten years have passed since last I was at Wicken in July, and having had little leisure of late, I decided to spend most of my summer holiday there—not a solitary flying visit as usual, but eighteen days with the family. Consequently, on July 10th, two market-carts dumped us and our luggage down by the duck-pond in front of the farm, where we were welcomed by all our old friends of the Bullman clan. The children immediately lost themselves in the farmyards, where they subsequently spent most of their time, and I went to make some calls. The first one shewed me that progress had not stayed his hand, even in Wicken. Calling at a shop, I was recognised, welcomed back, and immediately informed of a great advance the village had made since my last visit. "Oh! What is that?" I asked. "Why, we have now got public oil lamps. They are not lit in summer, so you may not have noticed them, but we have them every evening in winter. Now you don't find that in many villages you visit, do you?" I, of course, acquiesced that such a thing was usually undreamed of and passed on to interview Mr. Solomon Bailey, where I received a painful surprise. I had written him to say I was coming and had had his reply, but he had given no hint of his illness. All collectors visiting Wicken, who have not known of it, will be grieved to hear of the paralysis that has overtaken him. It has so much impaired his powers, that he scarcely ever gets to the fen, and that evening the place seemed unlike itself, without his cheery presence. He is

as keenly interested as ever in everything, and welcomes any ova that may be sent him to breed. Not getting about much, breeding appeals to him more than ever, but he has difficulty in obtaining material to start on. The first night in the fen was a fairly good one at light, and the treaced posts were crowded with Noctuids. These posts with bark nailed on have quite superseded the old grass knots. They are not quite so fascinating to work, but much cleaner. The old knots, I think, were the stickiest things I have ever touched. The large *Lasiocampids* were not yet out, but turned up on the 12th when *Eutricha quercifolia*, *Cosmotriche potatoria*, and *Malacosoma neustria* all made their first appearance. This (the 12th) was an almost first-class night at light. Amongst other things fourteen male *Phragmatoecia arundinis* came to the sheet. This species has steadily increased in numbers since the formation of the "Trust," and *Leucania obsoleta* is another species that has benefitted and increased owing to so many more reeds being left uncut. *Nascia cilialis*, on the other hand, seems slightly on the wane. It is to be hoped that this beautiful species will not revert to its former extreme rarity. After the 12th the weather entered upon the worst week I have ever known on any holiday. It rained for seven days and nights on end, with very few hours' exception; the sky never cleared once, and most of the time it blew half a gale as well. The duck-pond doubled in size, and in many places the fen dykes filled up and overflowed into the drove. Light for six nights was impossible and treacle only practicable once or twice, when Noctuids still swarmed. Dusk and day work were impossible, and most of the time was spent about the farm, yarning with Bailey, or chatting round Mrs. Bullman's kitchen fire. From the 19th onwards, however, the weather was ideal—fine by day, with warm, dark nights. Light was good all the time and plenty of things at dusk. Treacle remained good until the last three nights, and then the Noctuids partially deserted it for the reeds and grasses, on which they were found in great abundance. In spite of sunny days, we were never during this last week driven home by "fog," and several really good nights at light occurred. The "Lappets," "Drinkers," and "Tigers" on one of these so enthused my wife and a lady friend staying with us, that henceforward they ran a sheet of their own in addition to mine, and happily hit on a series of "showy" nights. The combined catch of *Cosmotriche potatoria* and *Malacosoma neustria* worked out into very nice series. They included a fine cream-coloured male and some good intermediate forms of *C. potatoria*, and some pretty colour-variations of *M. neustria*. *Arctia caja*, as usual at Wicken, was very constant in colouring and quite remarkably regular in first appearing between 11.45 p.m. and midnight. *C. potatoria* starts directly the lamp is lit and dwindles after the first hour, *M. neustria* comes commonly between 11 p.m. and 12 midnight, and *Eutricha quercifolia* at intervals all night. Without a watch one could quite well tell the time within half-an-hour by the times of arrival of the various species at light. Other species that seem to have notably increased in numbers since my last visit are *Leucania straminea* and *Plusia festucae*. Ten years ago they were both exceedingly rare here, but now *L. straminea* occurred every night on treacle in numbers varying from three to a dozen, and at dusk *P. festucae* was quite plentiful, flying to knapweed blossoms. It flew from late dusk

till about 9.45 p.m., and in the early days one could take from 12 to 15 a night. After that they began to decrease, but were still flying, even till the last night, when two or three were taken. Without a single exception all were netted flying to, or at rest on, knapweed blossoms, which abounded in the main drove. On the other hand all the *P. chrysitis* taken (not very many) were at thistle blossoms, which are scarce in the fen. Against the increase of these two species *Agrotis rorida* was almost an absentee. A fine specimen occurred on treacle the first evening, but after that not a single one was seen. This, in fact, was the only specimen of the year, so far as I could hear.

Bailey's introduction of *Bankia argentula* to Wicken has proved quite successful, and the species now abounds. One came to light on the 12th, a rather unusual occurrence I should imagine; but I cannot speak from experience as I have never worked light at Chippenham (where it swarms) and when last at Wicken *B. argentula* did not exist. *Toxocampa pastinum*, which I took on the 20th, was also to me a new Wickenite, although abundant at Chippenham. *Papilio machaon* still holds its own well. Larvæ were abundant, but of those collected none produced a second-brood, and the pupæ are lying over. A few pupæ that Bailey had, however, emerged, but the larvæ of these were of course more forward than mine. *Adopaea lineola* was abundant in Burwell Fen by the 25th, and swarmed all over the Tuddenham district, where I noticed a curious feature in its flight. Mr. Galpin, of Oxford, who wanted the species badly, was with me on the 26th, and we arrived on bicycles about 11 o'clock to find *A. lineola* skipping all over the place in the sun. Having to be back by 1.30 p.m., we turned our attention for an hour to *Dianthoeia irregularis* larvæ, meaning to wind up with half-an-hour at *A. lineola*. When we would have done so, however, it had absolutely vanished, nor did we find a single specimen before we left at 12.45, either flying or at rest. The conditions were quite unchanged, and other butterflies were flying freely.

A larvæ of *Manduca atropos* occurred in its "semi-final" stage in the village. It was then of the normal green colouring with typical stripes, but at its last change developed into an extreme specimen of the dark brown form, with almost invisible stripes, and the thoracic segments crowned with creamy-white, a most striking and awe-inspiring object. Larvæ of *Eumorpha elpenor* occurred in the ditches, belated *Earias chlorana* and crowds of *Lithosia griseola* at light. A few *L. var. stramineola* occurred, and one intermediate, exactly the curious buff shade of *L. deplana*. *L. lurideola*, generally scarce in the fen itself, was this year almost as common as *L. griseola*, and *Nuderia senex* swarmed both at light and dusk whenever the air was reasonably still. A single *N. mundana* occurred and *Phragmatoecia arundinis* came every night until the very end. *Notodonta siccae* was the only "prominent," and it occurred most nights, while *Cilix spinula*, *Leucoma salicis*, *Porthesia auriflua* and *Phalera bucephala* were other representatives of the Notodontids and Lymantriids. Noctuids, however, are the chief feature at Wicken, especially "wainscots," yet it is curious how poorly represented the "Nonagrias" are. *Calamia lutosa* occurs later, and larvæ of *Nonagria typhæ* were in the bull-rushes, but no others occur in the immediate neighbourhood. *Senta ulvae* has occurred sparingly of late years—quite a recent addition, I believe, although common at Ely—but was over. The species actually

taken on this visit were *Leucania pallens*, *L. impura*, *L. lithargyria*, *L. conigera* (all very common), *L. pudorina* (in countless numbers), *L. straminea*, *L. comma* (worn), *L. obsoleta*, *Tapinostola hellmanni*, *Chortodes arcuosa*, *Meliana flammea*, *Coenobia rufa* and *Calamia phragmitidis*. Although not strictly a "wainscot" *Arsilochia venosa* might be added, the first specimen of the second-brood occurring on the 25th. There were some early dates for Wicken (which is always rather backward), notably *Tapinostola hellmanni* on July 15th. This is a curious insect. It never appears before 11 p.m., is commonest in the small hours, and always quiet in its movements for a Noctuid. In spite of this it seems always to be worn. The first specimen I took was very worn, and, although it got fairly common before I left, I scarcely had half-a-dozen really good ones in all. It comes equally to light and treacle, but always late. The best way to get *Coenobia rufa* is at dusk, when it flies low through the shorter sedges, and has an aggravating way of dropping to the roots. A few came to light later, but not many. *Calamia phragmitidis* appeared on the 19th and rapidly became abundant. They were especially attached to the reeds and grasses, but a few came to light and treacle; some lovely rosy forms were among them. A quite good *Meliana flammea* surprised me at light on the 22nd, and the same night I took a fresh *Scoliopteryx libatrix* at treacle. This is a queer mixture, and a comparison of dates with a hybernated specimen taken at Hailsham on July 1st gives the imago of this latter species a possible life of eleven months. Perhaps the most interesting Noctuid was *Cleoceris riminalis*. The first specimen occurred on July 11th, ten days later than at Hailsham, and was so black that I did not recognise it at first. I have always reckoned this a scarce species at Wicken, but after the first week, there were three or four on every post and a number at light. I took none on the reeds or grasses, but it was common at late dusk, round the buckthorn bushes—attracted apparently, by a few belated blossoms. It varied from pale whitish-grey to nearly black, but, curiously enough, no others quite as dark as the first one taken. The species is evidently a tasty morsel. There is a long-legged, wainscot-coloured spider which secretes itself under the bark on the treacle posts, and preys on the moths. Its victims, almost without exception, were *C. riminalis*, even during the first week, when the moth was rare. Later on, it was a very common sight to see a specimen hanging in the spider's grip—always seized in the same way—just at the back of the neck, between head and thorax. In all, 77 species of Noctuids were noticed. Besides those mentioned, the more interesting were *Neuria reticulata* (a few at treacle in the village), *Helotropha leucostigma* (the first specimen on the 26th, my last night), *Agrotis nigricans* (in abundance), *Hadena suasa*, *Aplecta adrena* (nearly over), *Cosmia affinis* (common in the last week), *Herminia cribralis*, sitting about on the reeds abundantly, but getting worn, and *Hypenodes costaestrigalis* and *H. albistrigalis* both very occasionally at treacle. *Hydrelia unca* occurred at dusk on the 22nd, and at Chippenham Fen, *Rivula sericealis*, *Toxocampa pastinum*, and *Agrotis tritici* were in great numbers, and one fine *Plusia orichalcea* was netted over hemp agrimony. A notable absentee was *Triphaena interjecta*, usually so common, but of which I did not see a single specimen. Among the Geometrids, the most conspicuous are the buckthorn-feeders. At dusk, *Scotosia retulata* fly round all the bushes in clouds,

while *S. rhamnata* seem more confined to special spots. Round one bush they would abound night after night, and other bushes close by would not produce a specimen. Both are exceedingly difficult to get in good condition—neither come to light, but *S. rhamnata* sometimes visits treacle. Among these species are many *Collix sparsata*, which also seems attached to buckthorn, although for no apparent reason. It also occurs all over the fen and comes to light. A large pale form of *Cidaria testata* is all over the place, and *Epione apiciaria* is as common round the willows as *S. rhamnata* is round the buckthorns. *Acidalia immutata* of course is everywhere, especially at light, and so in less numbers is *Strenia clathrata*. Of the latter, more were seen at light than anywhere else, and it is the latest among the Geometrids to arrive—rarely appearing before 11 o'clock. Other light visitors were *Eupithecia scabiosata*, *E. valerianata*, *Lobophora sexualisata*, and several fine *Geometra papilionaria*, as well as one at treacle. One of these latter coming to the ladies' sheet at one o'clock in the morning, revived drooping interest in things in general. After midnight, the enthusiasm at this sheet generally had to be kept up a bit, by the aid of Mr. Galpin's Thermos' flask. Mr. Galpin arrived at Mr. Bullman's on July 24th, and produced a Thermos' flask, which was duly filled with hot cocoa. Hot cocoa in the fen after midnight is distinctly alluring, and the contents of the flask were much appreciated by the ladies, who somewhat unceremoniously appropriated them. Mr. Galpin proved his foresight by producing ginger-beer for his own use—a decidedly less inspiring beverage in the small hours. *Hyria muricata* was in the fen by day, but not common, *Timandra amataria* and *Cidaria pyraliata* in the drove above, plentifully, and *Lomaspilis marginata* still in good condition, and common wherever there were willows. *Acidalia emarginata* was scarce in the drove, *Hypsipetes elutata* was only just beginning to come out, and *Eupithecia rectangulata*, *Halia wararia*, and a strikingly marked *A. scutulata* occurred in the village. The latter had the typical markings much exaggerated and almost black in colour. The place where *Cidaria sagittata* larvæ were so abundant in 1899 was thoroughly searched, but not a specimen was found. The species is evidently entering upon another period of "lean" years, but will doubtless recover, as it has often done before. A day's bicycle ride to Bury St. Edmunds and back was made for *Anticlea berberata* and the larvæ were beaten not uncommonly from the barberry which grows there locally. *Scotosia certata* was in great abundance at the same spot in all stages of growth. Another trip to the Tuddenham district for *Dianthoeia irregularis* larvæ was very successful, the larvæ abounding. No non-botanical person, however, would recognise *Silene otites* as a champion, and I was glad I had read up a description of it beforehand. The larvæ turned out very unsuccessfully. I fed them at home on chickweed seeds, which they devoured greedily and the leaves and stalks as well. These proved much too succulent for them and the result was disastrous, only just over a dozen pupæ resulting. Crambids proved rather disappointing, although very many were examined. From the usual crowd of *Chilo phragmitellus* a single *Schoenobius mucronellus* was extracted, but among the smaller species nothing better than *Crambus uliginosellus* occurred. *C. selasellus*, as usual, was abundant at Chippenham. A few *Rhodophaea advenella* occurred at light, and

Aphomia sociella from time to time. Plumes of all sorts were scarce, even *Alucita pentadactyla*, whilst a few each of *Adkinia bipunctidactyla*, *Emmelina monodactyla*, and *Oidaematophorus lithodactyla* comprised the sum total in this group. All four species of Hydrocampids occurred sparingly, and, of course, some *Nascia ciliaris*, but, as before stated, fewer than usual. *Scoparia pallida* is the great Pyralid of the fen, and occurs exactly under the same conditions as *Nudaria senex* and nearly in the same numbers. Other Pyrales were *Botys fuscalis*, common in the fen, but commoner at Chippenham, where *Ebulea crocealis* also abounded. *Pyralis farinalis* swarmed in Mr. Bullman's barns and stables, *P. costalis* and *Aglossa pinguinalis* also, but unfortunately no *A. cuprealis*, although during the wet week I had plenty of time to search for them. The more open part of the farmyard produced a fine crop of thistles, and here, by day, the children commenced their entomological education; for common Vanessids and Pierids, *Gonepteryx rhamni*, *Eupinephele ianira*, etc., abounded and proved a source of great delight. Except when Mr. Houghton was down there, and until Mr. Galpin made a welcome addition to our party, we had the entire fen to ourselves. On the night of Mr. Galpin's arrival, Mr. Bailey managed to get down, and with his presence and a row of lamps, it seemed like old days again. We left with many regrets, and already I think longingly of the weird fen with its lamps, sheet, and buzzing moths. The charms of the place have also appealed to my wife and her friend, so it will not be many years before we return—next time, I hope, at the *Hydrilla palustris* time, and in a *palustris* year.

I have looked up the following references to Wicken collecting which have appeared from time to time in the *Ent. Record* since its commencement. They will doubtless be a useful guide to any of our younger collectors visiting the locality. The fact that no collecting notes have appeared since vol. xii. (1900), led me to write the foregoing article, but, in the "nineties," many references occur. Of other lepidopterological notes, referring more or less to the same time of the year as mine, the most exhaustive are our Editor's own papers in vol. ii., pp. 176 *et seq.*, and the still fuller one in vol. iii., pp. 196 and 229. These cover late July and early August and embrace both Macros and Micros most fully. Other references to the same season may be found in vol. iv., p. 234 (Moberly); vol. iv., p. 280 (Bouskell); vol. xii., p. 51 (Butterfield), vol. xii., p. 104 (James). Notes for other months are as follows:—*May*—vol. iii., p. 156 (Farren); vol. iv., p. 176 (H. A. Hill). *June*—vol. iv., p. 181 (Hodges); vol. iv., p. 208 (Hill); vol. iv., p. 209 (Porritt); vol. v., p. 180 (Hodges); vol. vii., p. 44 (Moberly); vol. x., p. 310 (Studd); vol. xii., p. 234 (Kaye). *August*—vol. vii., p. 65 (Brady); late August, vol. xii., p. 314 (Kaye); and vol. xii., p. 335 (Hill). *Summer generally*—vol. iv., p. 253; vol. v., p. 302; vol. vii., p. 90; vol. ix., p. 296 (all Moberly). The periodical captures of *Hydrilla palustris* are referred to in vol. v., p. 180 (Hodges); vol. ix., p. 296 (Moberly); vol. x., p. 232 (Studd); and in vol. xi., p. 113, Mr. Farren gives a full account of the captures of this species in the great 1898 year with description of its variation. A great night in May, 1892, is described by Mr. Farren in vol. iii., p. 156, whilst in a note (vol. xiv., p. 284) the Rev. C. R. N. Burrows impresses upon the collector to "never visit Wicken without waders"—a useful hint, but one teeming with awful suggestiveness, especially as the accompanying

notes are most meagre. Coleopterists will find very full notes covering 10 years' work by Mr. Donisthorpe in vol. x., p. 87, and others in vol. iv., p. 280 (Bouskell); vol. xi., p. 339 (Donisthorpe, with special reference to water-beetles); vol. xii., p. 263 (Donisthorpe); vol. xv., p. 152 (Chitty). The only reference to other groups is an article by Mr. Porritt (vol. ii., p. 291) where he gives lists of Neuroptera, Trichoptera, and Orthoptera taken towards the end of July, 1891.

Swiss Butterflies in 1908.

By DOUGLAS H. PEARSON.

"Under the cliffs at Vernayaz." This frequently recurring phrase in Mr. Wheeler's book and the *Ent. Record*, had long been a reproach, as I had many times hurried through Martigny without staying to sample its rich entomological treasures.

June 19th, 1908, found us at last on the classic ground, and the net was soon at work. The first good thing met with was *Brenthis daphne*, which was fairly plentiful and was specially attracted by a very sweet-scented white bramble; a nice series was obtained, but nothing showing marked variation. *Lowia alciphron* var. *gordius* was plentiful, both ♂ and ♀ in good condition, and a few well-marked *Erebia stygne* were taken. On reaching the marshy ground, search was made for *Polyommatus amanda* and it soon turned up, principally among the beds of high reeds. It was nowhere common, but was in fresh condition, though several specimens had chipped wings, possibly from contact with the reeds. Here also we found a few *Coenonympha iphis*, a species new to me, but all were somewhat worn and past their best. I worked diligently above the Tour Batiaz for *Agriades meleager* but could not turn it up, though I saw one taken by Rev. W. Pilson, between Saas-Grund and Stalden, about ten days later. One or two *Melitaea berisalensis* were bagged, two *Thecla spini*, and several *T. ilicis* on brambles, but the weather was windy and cloudy, and such gales arose at nights that many trees were rooted up, and in some cases the steamers on Lake Geneva were unable to land their passengers. A visit to Branson for *Nomiades iolas* was a failure, and nothing else of importance was taken.

On June 23rd we moved up to Visp, and on the 24th walked from Stalden, up the beautiful Saas Valley, to Saas-Fée, an interesting walk of fifteen or sixteen miles.

Insects were fairly plentiful all the way, and *Erebia ceto*, *E. euryale*, *E. erias*, *E. stygne*, *Pararge maera*, *Coenonympha* var. *darwiniana*, with very large spots, and *Lycaena arion* were numbered among the victims.

We stayed at Saas-Fée until July 8th and found it rich in both butterflies and flowers. I have never seen so many *Oeneis aëlo* as were flying together below a rocky face of the Gletscher Alp, and took three with one stroke of the net, and on the same ground took two *Erebia goante*, *E. gorge*, and one *Colias edusa*, a ♀ in good condition. *C. phicomone* was fairly common, but *C. palaeno* was not seen. *Melampus epiphron* was very common in the flat meadows near the village, and also at Saas-Grund.

A nice series of *Scolitantides baton* was taken, and though it was nowhere plentiful it was fairly widespread, and over a dozen were captured in the course of a morning's walk. A few *Polyommatus eros*

were also taken, and two or three *P. optilete* and *Aricia eumedon*. Down by the river, *P. pheretes* was flying, and included some nice females, three of them having the blue discoidal spot (ab. *caeruleo-punctata*), and others with blue powdering at the base of the wings. In the same meadows *Polyommatus hylas*, *Loweia dorilis*, *Chrysophanus hippothoë*, *Heodes virgaureae*, some varied forms of *Melitaea athalia*, *M. phoebe*, *M. dictynna*, and *Brenthis amathusia* were met with. One of the latter was a nice aberration in which the antemarginal black spots are joined to the dentated black edging, thus forming a series of loops.

Some very good ground was found above the Almagel waterfall, and here *Erebia tyndarus*, *Polyommatus orbitulus*, and *Melitaea* var. *varia* were abundant. The examples of *varia* sat on the damp patches on the path by scores, and it was an easy matter to kneel down and box two or three at a time. They had a curious habit of lying quite flat on their side when frightened, and were then difficult to pick up. Near Saas-Grund I took a remarkable aberration, which Mr. Wheeler, who was kind enough to go through some of my captures, refers to this species, though it is so unlike it, that I had supposed it to be *Melitaea asterie*. The upperside strongly resembles *M. dictynna*, but the light dots in the upper wing are prolonged into dashes. On the underside the ground colour of the upper wings is carried over the basal half of the lower wings, and has large black dots, but no white spots; the white band is very much wider than usual, and the antemarginal band almost obliterated. It is a form worthy of being figured.

On June 29th we walked up to the Mischabel Hut and spent the night there. Just below the Hut, at an altitude of over 11000 feet, a freshly-emerged *Pieris rapae* was found sitting on a rock. Possibly the pupa may have been carried up, but he was certainly some distance above his native cabbage-patch. A few *Melitaea cynthia* and *Melitaea aurinia* were taken near Saas, some *Lycaena alcon* including var. *nigra* and a variable series of *Lycaena arion*. Some of the latter were large and very rich examples of var. *obscura*, with broad black bands, and were found by searching low juniper bushes on a rainy afternoon.

The flowers of Saas were fine, and among other good things may be mentioned *Primula longiflora*, *Arctium vitaliana*, *Linea borealis*, *Eritrichium nanum*, *Androsace pubescens*, and *Senecio uniflorus*.

We left on July 8th with many regrets, and the walk down was one to be remembered. Erebias, Blues, and Skippers sat literally in crowds on the damp parts of the road, until it was difficult to make progress, and we nearly missed our train. Thirteen species of Blues were noted during the walk down, including *Polyommatus eros*, *Aricia eumedon*, *P. optilete*, and *P. donzelii*, and they formed a fitting finish to a most excellent holiday.

Everes argiades, Pall., E. dipora, Moore, and Binghamia parrhasius, Fab. (with plate).

By J. W. TUTT, F.E.S.

In his *Butts. of India*, iii., pp. 137-139, de Nicéville unites these three species in one. *Parrhasius* had for practically a century been considered distinct, and Moore had described *dipora* as a species quite separable from *argiades*. The difficulty of separating the Indian form of *argiades*, recently named var. *diporides*, by Chapman (*Nat. Hist.*

Brit. Butts., vol. iii.) from the real *dipora*, Moore, led to a considerable amount of confusion, and we find Elwes, in his "Catalogue of the Lepidoptera of Sikkim" (*Trans. Ent. Soc. London*, 1888, pp. 382-383), sinking *dipora*, Moore, as a synonym of *parrhasius*, Fab., and asserting that "this is a tropical form of the wide-ranging *L. argiades*, under the name *dipora*, Moore. It seems rare in Sikkim at low elevations, but is very common on the Khasia Hills in August and September, at 4000ft.-6000ft. on the grassy downs, and I have taken it also at Galle, in Ceylon." It happens, however, that the specimens of *dipora* (*teste* Elwes) in the British Museum coll., taken in north-west India by Elwes, are examples of *diporides*, Chapman, *i.e.*, they are really *argiades*, Pall., and hence is largely explained the cause of his disbelief in *dipora* and *parrhasius* as species apart from *argiades*. These, however, would possibly not include the three specimens he mentions that he had from Ceylon, nor the one from Java, all of which almost certainly would be *parrhasius*. This latter is so distinct a species that one marvels at de Nicéville sinking it as *argiades*. It was described over a century ago by Fabricius, and so specialised are the ancillary appendages that it appears to be, on this ground, more remote from *Everes argiades* than are *Cupido minimus* and *C. sebrus*, so much so that the name *Binghamia* has been suggested as a new generic name for it (*Nat. Hist. Brit. Butts.*, vol. iii., pp. 41-43).

When we started collecting the material for our account of *Everes argiades*, to be published in *The Natural History of British Lepidoptera*, vol. ix., we were obliged to follow the authorities, and among other details, prepared accounts of *E. alcetas*, *E. dipora*, *E. parrhasius*, and *E. polysperchinus*, in the belief that they were merely forms of *E. argiades*. The detailed accounts, thereof would, therefore, no longer be in place in our work, and yet it seemed advisable not to destroy the material collected without publication. Hence we have already printed (*antea*, pp. 231 *et seq.*) our account of *Everes alcetas*, Hoffmannsegg, and now propose publishing the much shorter notes on the two Asiatic species, that have been disentangled by Chapman from the "lumping" muddle, with which we started.

EVERES DIPORA, Moore, "Proc. Zool. Soc. Lond.," p. 506, pl., xxxi., fig. 8 (1865); Doherty, "Journ. As. Soc. Beng.," iv., pt. 2, p. 132 (1886). *Parrhasius*, Elw., "Trans. Ent. Soc. Lond.," pp. 362-3, *in part* (1888). *Argiades*, de Nicéville, "Butts. India," iii., p. 137, *in part* (1890).—Expanse ♂ $1\frac{1}{2}$ in. Upperside dull violet-blue; hindwing with a tail; a discocellular spot on forewing, and exterior margins of both wings broadly brown; cilia grey with a narrow medial brown line. Underside greyish cream-colour, exterior margins defined by a brown line; forewing with a narrow discocellular streak, and a transverse discal straight series of white encircled black spots; a submarginal row of pale brown spots; hindwing with three basal and a thrice interrupted discal series of eight white-encircled black spots; a medially disposed marginal orange-red band, bordered inwardly with brown lunules, outwardly with (two clear, the rest ill-defined) black spots; cilia as above. HABITAT: Kassowlie, N.-W. Himalayas. A slight delicate species from Kassowlie, not very common, generally found near water (Colonel A. M. Lang, R.E.). Everywhere in Kumaon from 1000ft. to 10000ft. The red area on the hindwing below is variable; the ♀ is dark brown above; the ♂ is indistinguishable from *E. parrhasius*, Fab. (Doherty). Colonel Lang has taken it near Naini Tal, from 3500ft. to 5500ft., June and July, and in the valleys above Raniket at about 5500ft., in April (Moore). DISTRIBUTION: N.-W. Himalayas—Kasauli; Kashmir (Moore); Kumaon, 1000ft.-10000ft. (Doherty); Naini Tal, 3500ft.-5500ft., above Ranikhet at 5500ft. (Lang); Kulu, Khasia, Kashmir, N. India, North-west Himalayas, Simla, Campbellpore (*teste* examples in Brit. Mus. Coll.) (Chapman).

This species, first described by Moore from examples taken in the North-west Himalayas, was sunk under the name *parrhasius*, Fab., by Elwes, in 1888, when the latter stated that "this was merely a tropical form of the wide-ranging *argiades*, Pall." Two years later, evidently overlooking Elwes' statement, de Nicéville, in 1890, wrote: "No author has placed the *parrhasius* of Fabricius and the *dipora* of Moore as synonyms of *argiades*, but no author has undertaken to show how these three species differ; I can find absolutely no character by which to separate them; in every direction the species is a most variable one, and these variations are not confined to any particular region or locality, though every variation could not be found in any one place." In the imaginal stage the direction of the median transverse row of spots on hindwing varies from that of any form of *argiades*; in *dipora* the four spots in the centre of this row are regular in series and at some distance from the discoidal lunule; in *argiades*, the same four spots curve rapidly round so that the fourth is quite near to the bottom of the discoidal lunule; the fourth spot is, therefore, in *dipora*, remote from the discoidal lunule as in *parrhasius*. Chapman points out that the ♂ ancillary appendages are also distinct. He further notes that it is curious that *dipora* and *argiades* var. *diporides* seem to inhabit North India together, and to resemble each other very much, so that when one has a broad black marginal border to the wings, so has the other.

BINGHAMIA PARRHASIUS, Fab., "Ent. Sys.," iii., pt. 1, p. 289 (1793); Don., "Ins. Ind.," pl. xlv., fig. 5 (♂) (1795); God., "Enc. Méth.," ix., p. 657 (1823); Horsf., "Cat. Lep. E. Ind. Com.," p. 86 (1829); Horsf. and Moore, "Cat. Lep. Mus. East Ind. Co.," p. 22, pl. ia., fig. 3 (♂) (1857); Butl., "Cat. Diurn. Lep.," p. 165 (1869); Snell., "Tijd. voor Ent.," xxi., p. 19 (1878); Semp., "Journ. des Mus. Godef.," xiv., p. 155 (1879); Moore, "Lep. Ceylon," i., p. 85, pl. xxxvi., fig. 7 (1881); Wood-Mason and De Nicév., "Journ. As. Soc. Beng.," i., p. 234 (1881); Dist., "Rhop. Mal.," p. 221, fig. 66 (♂) (1884); Elwes, "Trans. Ent. Soc. Lond.," pp. 382-3 in part (1888); *Argiades*, de Nicév., "Butts. Sum.," p. 455, in part (1895).—*Hesperia Ruralis*. Alis caudatis cœruleis (fuscis) subtus cinereis albo strigosis; posticis punctis marginalibus aureis. *Papilio parrhasius*. Ion fig. pict. 6, tab. 16, fig. 2. Habitat in India, Dom Drury. Parva. Alae omnes cœruleæ margine fusco et posticæ ante marginem striga punctorum nigrorum, ocellatorum. Subtus omnes cinereæ, pone medium albo undatæ. Posticæ præterea punctis tribus baseos atris annulo albo cinctis, apice punctis quatuor aureis: tertio puncto atro natato (Fabricius).

It has been generally assumed, no doubt correctly, that the insect described by Fabricius, is the one so generally distributed, and locally abundant, all over Southern and Further India, the Malay Archipelago, the East Indies, extending into West and North Australia in the south, and reaching into North India, where it overlaps *Everes dipora* in the north. This insect, judged only by the appearance of the series in the British Museum collection, is most distinct, and can hardly be mistaken, even superficially, for any other species. Moore and Distant treated it as distinct, the former correctly discriminating it from the species he described as *dipora*, and recognising also that the latter was specifically distinct from *argiades*, Pallas. Moore figured and described *parrhasius* at length in his *Lep. of Ceylon*, etc., i., p. 85, pl. xxxvi., fig. 7, in 1881, as follows:—

♂ 1mm., ♀ 1·25mm. ♂ *Upperside*: All wings deep violet-blue, with a narrow, brown outer-marginal band; the band of the hindwing with black spots slightly bordered with white. *Underside*: Wings greyish-white; forewing with a white-bordered, dusky-brown, discocellular lunule, an outer discal lunular line, and two

marginal lunular lines; the hindwing with three black sub-basal and an apical spot, a white-bordered, dusky-brown, discocellular lunule, a discal row of lunules, and a marginal lunular line, the latter enclosing two large subanal black spots bordered with ochreous. ♀ *Upperside*: Both wings violet-brown, the lower basal and discal areas more or less greyish-blue; the hindwing with a marginal row of white-bordered, black spots, the two spots between the median nervules bordered with a red inner lunule. *Underside*: Both wings as in the ♂. Occurs in Ceylon at "Colombo, in open and cultivated land" (Hutchison); "Galle and Kandy, very common" (Wade). *DISTRIBUTION*: Java (Horsfield), Bengal, Ceylon (Moore), Mhow (Swinhoe), Nicobar Isles (Wood-Mason), Malacca, Singapore (Distant), Celebes (Snellen), Australia (Semper) (Moore).

Distant also described it in 1884 (*Rhop. Malayana*, p. 221), and, besides the detailed description, he notes:—

Exp. wings ♂ and ♀, 24 to 30 millim. *Hab.*: Continental India, Sikkim (Calcutta Mus.), N.-E. Himalaya (coll. Dist.), Ceylon (Thwaites' coll. Dist.), Nicobar Is., Nankouri (Wood-Mason and de Nic.), Malay Peninsula, Malacca (Biggs' coll. Dist.), Singapore (Kerr—coll. Dist.), Java (coll. Horsf.), Celebes (Snellen). I did not receive this species in time to have it lithographed with the other members of the family, but the woodcut will be quite sufficient—if the description is also consulted—to at once determine this well-marked *Lycænid*. Its geographical range is doubtless far wider than I have been at present able to determine (Distant).

Elwes seems (*Trans. Ent. Soc. Lond.*, 1888, p. 382) to have been the first to throw doubt on its specific distinctness, and in his "*Lepidoptera Sikkim*" (*op. cit.*) writes:—

LYCAENA PARRHASIUS.

Hesperia parrhasius, Fabr., "Ent Syst.," iii., 1, p. 289 (1783).

Lycaena dipora, Moore, "Proc. Zool. Soc.," 1865, p. 506, pl. xxxii., fig. 8.

This is a tropical form of the wide-ranging *L. argiades*, Pall., which occurs in the north-west Himalaya under the name of *dipora*, Moore. . . . A comparison of my Indian series, viz., 10 pairs from the N. W. Himalaya, 6 pairs from Khasia, 3 from Ceylon, and one from Java, with 6 pairs from Japan, 2 from Shanghai, and 12 from Germany, leads me to doubt whether *parrhasius* and *argiades* can be distinguished with certainty, etc.

We have already noted that Chapman has determined that at least part of Elwes' Indian specimens (those now deposited in the Brit. Mus. coll.) are really *Everes argiades* ab. *diporides*, Chapman, and that this probably accounts for the sweeping character of the statement quoted.

In 1890, de Nicéville (*Butts. of India*, etc., p. 138), as noted *antea*, p. 303 states that "no author has placed *parrhasius*, Fabr., and *dipora*, Moore, as synonyms of *argiades*, Pall., but no author has undertaken to show how these three species differ. I can find absolutely no character by which to separate them," etc. He followed this statement up in 1895, by boldly sinking *parrhasius* (*Butts. of Sumatra*, p. 455), when dealing with the Sumatran insect (which is undoubtedly *parrhasius*), as *Everes argiades*, and writes of it:—

Everes argiades, Pallas. [Snellen as *parrhasius*; Hagen as *parrhasius*. It has been described by Herr N. Kheil, from Nias, as *Pliebeius polysperchinus*.] In Sumatra it is common at low elevations in October and November; as usual the ♂s on roads, the ♀s on flowers in small jungle. In his valuable work on *The Rhopalocera of Nias Island*, Herr Kheil calls *Polyommatus boeticus*, Linn., the "*cardui*" of the *Lycaenidae*, but *E. argiades* better deserves that epithet as it has a still greater range, occurring in North America under a slightly modified form (as *E. comyntas*, Godart), which *P. boeticus* does not do. Dr. Martin notes that European specimens of *E. argiades* have the spots on the underside of the wings, somewhat more prominent than on Sumatran examples.

It will be observed that de Nicéville refers Kheil's *polysperchinus* to the Sumatran insect. There can be no doubt that it is merely

the Sumatran *parrhasius*, as Kheil gives no indication to show that this form from the little island of Nias, off the west coast of Sumatra, differs from other oriental forms of that species. The following is Kheil's note thereon:—

PLEBEIUS POLYSPERCHINUS, Kheil, "Rhop. of Nias Island," p. 29 (1884).—*Plebeius polysperchinus*, approaching the European *P. polysperchon*, but larger and bluer in colour. The fringes are white, with grey divisional lines; the edges are black (Kheil).

As already pointed out, besides the difference in the general character, appearance, and build of *parrhasius* and *argiades*, the spotting of the underside of the hindwing differs in the two species, and the ancillary appendages of the ♂ has been shown by Chapman to be entirely different, and to separate the species very considerably.

Our study of the British butterflies seems to be leading us very far, and it would appear that our old assertion, that almost every British species is the representative of a distinct and interesting group, highly specialised elsewhere, is not only proving correct, but is leading us to call on our collaborators to help us to undertake a revision of these groups, before we can really begin to understand the details bearing on the relationship of our few British species to one another. We have already been able to show that *Lampides boeticus* stands nearly alone in the world's fauna, and that the species tacked on to it generically by systematists have really no close relationship, whilst Dr. Chapman has, by the study of *Celastrina argiolus*, revolutionised our knowledge of the Celastrinids most closely allied thereto, proving that apparently distinct species are only forms of our common insect, and now he is able to show, on structural grounds, that *Everes alcetas*, Hoffmansegg, and *E. dipora*, Moore are quite specifically distinct from *E. argiades* and that *parrhasius* is sufficiently so to require a new genus, in a tribe, where the species are so nearly allied structurally, as is the case in the tribe *Everidi*.

ORTHOPTERA.

NOTE ON LABIA MINOR, L.—I found a few examples of this little earwig on the wing last month, near the village of Winlaton, and to-day, whilst examining a manure heap in Aswell Park for coleoptera, Professor Beare and I have turned it up in large numbers. I was struck with the peculiar superficial resemblance to *L. minor* of a rather common beetle, *Lithocharis ochracea*, found with the earwig.—RICHARD S. BAGNALL, F.E.S., The Groves, Winlaton. November 1st, 1908.

HEMIPTERA.

CRYPTOSTEMMA ALIENUM, H.-S., FROM THE COUNTY OF DURHAM.—This fragile creature occurs commonly amongst shingle by the banks of the Tarsset Burr, at Tarsset, on the North Tyne, Northumberland, and also on the banks of the Derwent, near Winlaton Mill, in the county of Durham. *Cryptostemma (Dipsocoris) alienum* has been taken on the banks of the river Till by Hardy (Bold, *Nat. Hist. Trans. Northumberland and Durham*, iv., 1872, p. 363), but has not been previously recorded from the county of Durham.—RICHARD S. BAGNALL, F.E.S., Winlaton. November 1st, 1908.

DONATA.

PUGNACITY OF ANAX IMPERATOR, LEACH.—One afternoon in June last, on a brilliant day with no wind, at about 4 o'clock, round a certain pond in Esher fir-woods, there were a great many ♂ *Anax* on the wing. One I struck at with a net but missed, and the insect began to soar away above the trees. At this moment a ♂ of *Libellula quadrimaculata* passed about a foot beneath it. *Anax* turned and swooped like a hawk and then flew slowly away with its prey. I now managed to capture both, but in the net *Anax* released its victim. On examination the latter proved to be nearly dead. The body was bent and broken, one of the large compound eyes was severely dented, and the pronotum was so damaged that the insect was unable to move its head. It is possible that *Anax* pounced on *L. quadrimaculata* with the intention of making a meal (Mr. Lucas has recorded a case of *Anax* eating a specimen of *Sympetrum scoticum*), but it seems more probable that he was indignant at *L. quadrimaculata* poaching on what he deemed his preserves, as I have frequently seen a ♂ *Anax* fly hawking up and down a certain marked beat and return after chasing away an intruder.—W. P. FENWICK, F.E.S., The Gables, New Road, Esher. November 3rd, 1908.

CHANGE OF COLOUR IN A NYMPH.—Early in May last, at the same pond, I dredged up an Agrionine nymph (species uncertain) among some green water-weeds, which it closely resembles in colour. I placed it in a vessel of water, at the bottom of which was mud, with dead leaves, pieces of stick, etc., and, on looking at the nymph three days later, I found that it had assumed the colour of the mud and was quite brown, every trace of green having disappeared. Though the nymph was, of course, carnivorous, it must have taken up a small quantity of the weed to produce the green colour, and then, when that was voided, some of the mud to produce the brown, thus protecting itself against possible enemies. This power of assuming protective colouring the nymph shares with another aquatic larva, that of *Phrygania grandis*, which, it is recorded, when clad in a case formed by portions of dead brown leaves, if placed in a vessel with fresh growing water-plants, discards the old brown case, replacing it with a green one, so that it resembles in colour its environment.—W. P. FENWICK.

CURRENT NOTES.

In the *Zoologist* for November, Mr. Donisthorpe has a most interesting note entitled "A few notes on Myrmecophilous spiders."

At the meeting of the Entomological Society of London on October 21st, Mr. G. C. Champion showed a specimen of *Pytho depressus*, L., with two tarsi to the right hind-leg. It was bred from a larva or pupa found under pine-bark at Binn, Switzerland, and the abnormal growth may have been due to the attacks of other larvæ kept in the same box. At the same time Mr. E. C. Bedwell exhibited examples of the rare Lamellicorn beetle, *Gnorimus variabilis*, L., found by him in thick frass under the bark of oaks, near Purley Oaks, Surrey, in the larval state in May last, and again as imagines in the same locality in the following month. He described the species as one becoming extinct

in the United Kingdom. The President said it had been reported from Windsor Forest in 1892.

At the same meeting, Mr. W. J. Lucas brought for exhibition eight examples of *Libellula quadrimaculata* from Scotland and the south of England, to illustrate the range from the type form to the var. of *praenubila* of Newman. The variation take two lines, one, the development of the blackish suffusion beneath the nodes and pterostigma; secondly, a saffron suffusion parallel to the costa.

Mr. L. W. Newman also exhibited paintings of two forms of *Dryas paphia* bred by him this season from ova of parent taken at Brockenhurst, resembling in facies the aberration of this butterfly shown by Dr. Herbert Charles at the preceding meeting, whilst Mr. H. M. Edelsten exhibited a tube containing ova of *Leucania brevilinea*, *in situ*, laid within the sheathing leaf of a dead reed-stem found in Norfolk in July, 1908.

Mr. A. Harrison exhibited a long series of *Aplecta nebulosa*, of the form *robsoni*, bred from parents taken in Delamere Forest. He said that the proportion in breeding was as follows:—Grey form, 25%; var. *robsoni*, 51%; and var. *thompsoni*, 24%.

The Council of the Entomological Society of London has recommended to the Fellows, the following gentlemen for election as Council (excluding the officers) for 1909:—President: Dr. F. A. Dixey, Oxford (1887). Other Members of Council: Mr. C. A. Waterhouse, London (1869), Professor E. B. Poulton, Oxford (1884), Mr. J. W. Tutt, London (1886), Dr. T. A. Chapman, Reigate (1891) Dr. K. Jordan, Tring (1894), Mr. Guy A. Marshall, London (1895), Mr. A. Harrison, London (1897), Mr. S. Image, London (1897), Mr. Hugh Main, London (1899), Mr. R. Shelford, Oxford (1901), Dr. Longstaff, Mortehoe and Oxford (1904), Mr. R. Turner, (?) Oxford (1907). The dates in brackets show when each member was elected a Fellow of the Society. Strong as, in some respects, this list appears, one somehow feels that the Council ought to be more representative, and that the larger provincial towns, in various parts of England and Scotland, should, at least, have a fair share of the places; also that strenuous work for the Society, spread over a reasonable time, should be, at least, one of the main points in selecting Fellows for so honourable a position.

The older members of the City of London Entomological Society will be interested to know that Mr. H. S. Woolley, a former member, has been elected President of the Waterbury Naturalist Club, Connecticut, U.S.A., a local society that seems to be in an exceedingly flourishing condition.

The Birmingham Natural History and Philosophical Society held a reception, followed by a dinner at the Grand Hall, Birmingham, on November 17th, to commemorate the fiftieth anniversary of the Foundation of the Society, Mr. H. Willoughby-Ellis, President, in the Chair. The function was a most enjoyable one, and well attended—several ladies being among the guests. The speakers were Professor Poulton, Professor Carlier, Sir Oliver Lodge, The President, Dr. J. Hall-Edwards, Messrs. John Humphreys, G. H. Verrall, H. St. J. K. Donisthorpe, J. W. Tutt, and W. E. Collinge. The President and Mrs. Willoughby-Ellis are to be heartily congratulated on the great success achieved.

The President, in his charming speech, gave an excellent *resumé* of the origin, the history, the aims, and successful results of the Birmingham Society. Some of the earlier speakers dwelt most strongly on the work of the members being directed to experimental studies, when the results might be handed over to be dealt with by the Professors of the University, etc. Mr. Verrall preferred to look on the study of natural history as a hobby, leading men to look into the wonders of nature for themselves, whilst Mr. Tutt suggested that it would be a bad thing for the Society if it became merely an appanage to the University, claiming that this Society, like almost all the most successful of the old societies in the south-east of England, was formed by working-men, and that men of various tastes, but all with natural-history instincts, must still be the main source of support for this and kindred societies, and that though many would never, and could not be expected to, reach the standard of work set by modern science, yet some would, and that, when these had reached the necessary accuracy in their work to amass scientific data, they would, most probably, deduce better scientific conclusions than the University Professor, who could only know, second-hand, the many details by which the worker himself had obtained his results, and arrived at his conclusions. Mr. Collinge, in a most interesting speech, supported the same view, holding that the Natural History Society must still obtain its strength, and life, and vitality from men of varied social position, who were naturalists before everything, and that if they were sound naturalists, real science would certainly grow out of their work, and its value be largely increased by the help, always to be obtained within the Society, from men whose studies tended in the same direction. Most of the speakers dwelt on the formation of a City Museum as one of the most praiseworthy pieces of work that the Society, and its members in their corporate and individual capacity, could undertake. We understand that first-class rooms in the new Municipal Buildings have since been allocated for this purpose.

The South-Eastern Union of Scientific Societies, to which more than 50 Societies in the south-eastern corner of England are affiliated, held its autumn meeting at Tring, on November 27th. Some 75 members put in an appearance and were kindly received by the Hon. Walter Rothschild, Dr. Hartert, Dr. Jordan, and Mr. Neumann, at the Tring Museum. A most enjoyable and instructive day was spent, Mr. N. C. Rothschild joining the Entomological section in the room devoted to Entomology. Later, tea was served in the dining-room of "The Rose and Crown," after which Mr. J. W. Tutt proposed, and Mr. Gwinnell seconded a vote of thanks to the Hon. Walter Rothschild and his Curators for their great kindness, the former and Dr. Hartert suitably replying, Mr. Rothschild kindly expressing the hope that the members of the affiliated societies would again hold a meeting at the Museum, or, if this were not possible, that individual members and their friends would come for pleasure or study, and that he would be pleased to place any special group of natural history objects at the disposal of any student who might wish to work at it, at the Museum.

It is with the greatest regret that we note the death of Professor Alfred Giard, who was President of the Entomological Society of France in 1896, and again in 1900.

The current Bulletin of the Entomological Society of France records that Mr. E. Gounelle has made a donation of 500 francs towards the publication fund of the Society, whilst the annual subventions from the Ministers of Education and of Agriculture amount respectively to 500 and 570 francs.

No award has been made this year in connection with the "Prix Constant."

SOCIETIES.

CITY OF LONDON ENTOMOLOGICAL SOCIETY.—*November 4th, 1908.*—EXHIBITS: *Triphaena comes*, the hindwings clouded with black, Folkestone, July, 1908, Mr. R. G. Benton. *Pieris rapae*, bred from Redhill larvæ, the pupæ of which had been subjected to alternate spells of high and low temperatures. The imagines showed an intensification of the yellow coloration on the undersides, thus resembling Scotch specimens, Dr. G. G. C. Hodgson. *SMERINTHUS HYBR. HYBRIDUS* (*Smerinthus ocellata* ♂ × *S. populi* ♀), the percentage of females being very small, Mr. L. W. Newman. The Rev. C. R. N. Burrows stated that, of the examples he had examined, one male only appeared to be fully-developed, while nine apparent females were all more or less gynandromorphous. He observed, from an examination of the genitalia of the "wasters," that the amount of gynandromorphism was remarkable. No two appeared to be alike, some specimens being nearly ♂, some nearly ♀, and intermediates; so far, no true perfect ♀ has been observed, but one ♂ appeared to be truly that sex; of course, its ancillary appendages are entirely different from those of either parent. He further observed that the hybrids contained an enormous quantity of fat. The peculiar condition of the ancillary appendages is on all fours with Mr. Newman's observations and, perhaps, partly explains his difficulty about the antennæ of these gynandromorphs being sometimes nearly ♂, sometimes nearly ♀; Mr. Burrows has not yet had to do with one specimen with true ♀ genitalia. *PIERIS BRASSICÆ*, with a partial narrow black border upon the hindwings, from Surrey, Mr. A. E. Tonge. *November 18th, 1908.*—EXHIBITS: *NONAGRIA EDELSTENI*, TUTT (*NEURICA*, SCHMIDT), from Sussex, new to the British list, also *N. neurica*, Hb., and its var. *dissoluta*, Tr., from various localities, Mr. H. M. Edelsten. *THYATIRA BATIS*, with the usual pink coloration replaced by brown (Linne's type), and *MIANA STRIGILIS*, with red central fascia and white marginal band; both from Ashford, Kent, 1908, Mr. G. H. Heath. *ANTHRO CERIDS*, from one Surrey locality, mainly *Anthrocera trifolii* and *A. hippocrepidis*, Stphs., including several melanic examples of the former; one example, apparently *A. hippocrepidis*, with right hindwing resembling that of *A. purpuralis* (minos), Dr. G. G. C. Hodgson. *PLEBEIUS ÆGON*, a series from Eynsford, July, 1908, including a blue female, Mr. V. E. Shaw. *AMPHIDASYS BETULARIA* and var. *DOUBLEDAYARIA*, bred from a female of the latter form taken at Wicken, Mr. P. H. Tautz. *POLYGONIA C-ALBUM*.—A long series of bred specimens, including a few with the **C** transformed into a **D**, Mr. L. W. Newman. PAPER.—Mr. L. W. Newman read some interesting notes on his observations made while breeding *Polygonia c-album*, and recorded the following as facts observed:—(a) The first ten to fifteen ova laid by a female in the spring produced var.

hutchinsoni. (b) The remainder of the ova laid in the spring produced the normal form. (c) The *hutchinsoni* imagines emerge first, pair, and lay ova, which produce the autumn brood. (d) The normal imagines emerge later than var. *hutchinsoni*, refuse to pair, and go into hibernation early in the summer. (e) So far as rearing in captivity is concerned, hibernation has not been successfully carried through.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—October 22nd, 1908.—EXHIBITS: Mr. McArthur exhibited a long series of *Argynnis aglaia* and fine specimens of *Asteroscopus nubeculosa* from Aviemore. Mr. Tonge bred specimens of *Pieris brassicae* with partial black margin to hindwings; *Cerura bijda* bred from a Reigate ♀; a very varied series of *Agrotis cursoria* from Lowestoft, and a long series of *Hydroecia nictitans* from the same place. Messrs. Harrison and Main, a bred series of *Nemeobius lucina* from ova from Horsley, and two larvæ of *Limenitis sibylla* in their curious hybernacula on sallow from the New Forest. Mr. R. Adkin, series of *Rhodophaea suavelia* and *R. marmorea*, with branches of blackthorn showing their larval webs, from Eastbourne, and read notes on the species; a specimen of *Peronea permutana* bred from a larva taken on *Rosa spinosissima* at Beachy Head; and unusually light and dark forms of *Tortrix heparana* from the same locality and Lewisham. Mr. Newman, a series of *Dicranura bicuspis* bred from Tilgate Forest, and an example of *Abraxas grossulariata* ab. *varleyata* ♀, just bred as second-brood. Mr. Main, sprays of blackthorn, on which were ova of *Ruralis betulae*. Mr. Smith, *Plodia interpunctella* found in the Society's Library just previous to the meeting. Mr. Rayward, a specimen of *Epinephele jurtina*, with considerable pallid areas, and ♂ and ♀ specimens of *E. tithonus* with additional spots on the forewings. Mr. F. Noad-Clark showed, under the microscope, the early instars of *Nola albulalis* larvæ, and the ova of *Coleophora virgaureae*, *in situ*, among the pappus hairs of golden-rod. November 12th, 1908.—BREEDING MELITÆA AURINIA UNDER ARTIFICIAL CONDITIONS.—Bred and captured series of *Melitæa aurinia* from Kent, the former, large and of vivid colour, were reared in a humid orchid house, and were referable to var. *provincialis*, Mr. Kaye. XANTHIC EPINEPHELE JURTINA.—Several extensively xanthic specimens of *Epinephele jurtina* (*janira*) taken in N. Cornwall, Messrs. Harrison and Main. FOODPLANT OF COREMIA FERRUGATA.—A series of *Coremia ferrugata* bred from ova; the larvæ were fed on common *Galium* and would not touch ground ivy, Mr. R. Adkin. ABRAXAS GROSSULARIATA PARTIAL SECOND-BROOD.—A rayed specimen of *Abraxas grossulariata* ab. *varleyata* ♂, bred on November 11th, a second-brood specimen, Mr. Newman. ALEOCHARA CRASSIUSCULA.—A series of the rare and recently discovered species, *Aleochara crassiuscula*, taken at Lewisham, a new locality, Mr. West (Greenwich). THIRD-BROOD EXAMPLE OF CELASTRINA ARGIOLUS.—A specimen of a third-brood of *Celastrina argiolus*, bred on October 18th from September larva, Mr. Coote. MELANIC CLEORA GLABRARIA.—A bred melanic example of *Cleora glabraria* from the New Forest, Mr. Smith.

Something for Christmas.

An elderly entomologist was out collecting one evening, when he

saw a smallish boy with a net and boxes, but no other implements, dodging about in the dark. The following dialogue ensued:—

"Well, my boy, and what are you after?"

"Moths sir!"

"Have you caught many yet?"

"No sir!"

"Ah! I see; you are a beginner and don't really know how to set about the work. You must get a book about it, with hints. You'll want a lantern and some treacle, and a few other implements. But the best way is for you to get an elementary book—a very elementary one—read it, and then have another try, and I feel sure you will meet with more success."

After thanking the gentleman the boy went home. A few days afterwards the gentleman again saw the boy acting in precisely the same manner as on the previous occasion. Somewhat surprised, he said—

"Well, didn't you get the book I suggested to you?"

"Yes sir! But I couldn't understand it, and it didn't seem to help me a bit."

"Oh! The book you got was, evidently, not elementary enough. I told you to get a very elementary book. By the way, what book did you get?"

"Advice to Young Moth-ers."

J.H.T. (overheard).

ERRATA.—The following important misprints should be carefully corrected in this volume—Page 203, line 45 (and line 2 *footnote*) for "Stdfss." read "Austaut"; p. 203, line 15, for "*fangi*" read "*langi*." Page 204, line 4, for "sec." read "tert." and for "*lippei*" read "*burckharti*"; p. 204, line 17, for "*wetteri*" read "*walteri*"; p. 204, line 20, for "*luciens*" read "*luciani*"; p. 204, line 25, for "*gallii*" read "*elpenor*."—PAUL DENSO.

Page 252, headline.—For comp.'s howler "The Genius *Apion*" read "The Genus *Apion*."

CONTENTS OF VOLUME XX.

	PAGE.
COLEOPTERA 1, 25, 33, 56, 62, 82, 91, 108, 184, 208, 215, 229, 237, 252, 255, 282	
CURRENT NOTES 20, 42, 69, 94, 120, 146, 187, 217, 241, 267, 306	
DIPTERA 147	
HEMIPTERA 231, 305	
HYMENOPTERA 34, 57, 99, 106, 215, 231, 281	
LIFE-HISTORIES, LARVÆ, ETC. 64, 92, 212, 240, 266	
NOTES ON COLLECTING 17, 62, 91, 119, 144, 185, 215, 237, 266	
ODONATA 306	
ORTHOPTERA 16, 58, 61, 110, 117, 121, 142, 195, 230, 257, 275, 305	
SCIENTIFIC NOTES AND OBSERVATIONS 67, 93, 120	
VARIATION 20, 41, 67, 91, 120, 144, 172, 217	
ABERRATIONS AND VARIATIONS OF:— <i>Abraxas grossulariata</i> , 30; <i>A. sylvata</i> , 23; <i>Acidalia scutulata</i> , 298; <i>Anthrocera achilleae</i> , 74; <i>A. trifolii</i> , 23; <i>Araschnia levana</i> , 21; <i>Agrion corydon</i> , 20; <i>Boarmia repandata</i> , 121; <i>Camptogramma fluviata</i> , 270; <i>Celastrina argiolus</i> , 120; <i>Cleoceris viminalis</i> , 297; <i>Coenonympha tiphon</i> , 245, 278; <i>Crambus chrysonuchellus</i> , 242; <i>Diloba caeruleocephala</i> , 243; <i>Dryas paphia</i> , 268; <i>Drymonia chaonia</i> , 68; <i>Ematurga atomaria</i> , 17; <i>Ennomos autumnaria</i> , 68; <i>Epirrita autumnata</i> , 67; <i>Eupithecia absinthiata</i> , 20; <i>Eurrhyncha urtica</i> , 242; <i>Lasiocampa quercus</i> , 43, 272; <i>Melanippe fluctuata</i> , 62; <i>M. sociata</i> , 217; <i>Melitæa asterie</i> , 301; <i>M. athalia</i> , 68, 107; <i>M. aurinia</i> , 68; <i>M. phoebe</i> , 105, 169, 170;	

- Nemoria viridata*, 133, 243; *Noctua rubi*, 270; *Odezia atrata*, 222, 260; *Papilio machaon* (larva), 240, 266; *Polyommatus orbitulus*, 274; *Rumicia phlaeas*, 271; *Setina aurita*, 98, 126, 149; *Xylophasia rurea* . . . 17, 41
- ADDITIONS TO THE BRITISH LIST:—*Acoelius viator*, Först., 284; *Agromyza bicornis*, 241; *Aleochara crassiuscula*, Sahlb., 241; *Amavrosoma armillata*, Ztt., 147; *A. inermis*, Becker, 147; *Anisotoma flavicornis*, Ch., 241; *Anthomyza unguicella*, Ztt., 147; *Anthrocera achilleae*, Esp., 73, 185; *A. trifolii* ab. *obscura*, Tutt, 23; *Anurida tullbergi*, Schött., 33; *Brachypeza radiata*, Jenkinson, 147; *Calodera protensa*, Mann, 241; *Cartodere argus*, Reitt., 3; *Ceuthorrhynchus parvulus*, Bris., 241; *Ceraphron formicarum*, Kieffer, 106; *C.*, sp. (?), 106; *Coelioxys agra*, Lep., 241; *Conostigmus*, sp. (?), 106; *Cryptocephalus bipunctatus* (type), L., 208; *Cryptophagus pallidus*, Stm., 3; *C. subdepressus*, Gyll., 3; *Ctenopus sulphureus* var. *bicolor*, F., 5; *Diastata inornata*, Lw., 147; *Dysstroma concinnata*, Steph., 143; *Eccoptomera microps*, Mg., 241; *Euplectus bescidicus*, Reitt, 56; *Exallonyx funipennis*, Keif., var. *donisthorpei*, Keif., 106; *E. wasmanni* var. *sociabilis*, Keif., 106; *Haliphus immaculatus*, Gerh., 1; *Helophorus porculus*, Bed., 122; *Hyadina nitida*, Mcq., 241; *Hydraena longior*, Rey, 2; *Hydroecia crinanensis*, Burrows, 184; *Laccobius purpurascens*, Newbery, 43; *Lagynodes pallidus*, Boh., 106; *Malthodes minimus*, L., var. *marginicollis*, Schilsky, 82; *Melanophthalma truncatella*, Mannh., 91; *Meligethes viduatus* var. *aestimabilis*, 122; *Micrambe villosa*, Heer, 146; *Nemoria viridata*, L., ab. *caerulescens*, Burrows, 133; ab. *concavilinea*, Burrows, 133; ab. *olivaceo-marginata*, Burrows, 133; ab. *rufotincta*, Burrows, 132; *Noctochilus hamulatus*, Thom., 267; *Nonagria edelsteni*, Tutt, 268, 286, 309; *Ochthebius viridis*, Peyron, 2; *Olophrum assimile*, Pk., 255; *Ornithopsylla laetitiae*, Roths., 241; *Pegomyia esuriens*, Mg., 147; *P. univittata*, v. Ros., 147; *Phalacrus championi*, Guill., 2; *P. hybridus*, Flack, 2; *Phora albicans*, Wood, 218; *P. campestris*, Wood, 218, 241; *P. dubitalis*, Wood, 218; *P. emarginata*, Wood, 218; *P. flavicauda*, Wood, 267; *P. fuscineris*, Wood, 218, 241; *P. intermedia*, Malloch, 241; *P. paludosa*, Wood, 218, 241; *P. retroversa*, Wood, 218, 241; *P. rufa*, Wood, 218; *P. spinigera*, Wood, 218, 241; *Phyllotreta diademata*, Foudr., 191; *Plagiolepis alluardi*, Forel, 71; *Platygaster*, sp. (?), 106; *Polynema albitharse*, Kieffer, 106; *Ponera punctatissima* var. *boerorum*, Forel, 71; *Prenolopis caeciliae*, Forel, 71; *P. flavipes*, Smith, 71; *Sapromyza quadrivittata*, Lw., 147; *Sematochlora metallica*, Lind., 269; *Strumigenys rogeri*, Emery, 71; *Sunius lyonesiensis* (? *angustatus* ab.), Joy, 229, 241; *Wasmannia auropunctata*, Roger, 71; *Xantholinus distans*, Kr. 148
- EGGS OF:—*Adopaea flava*, 15 (plate); *Borkhausenia pseudospretella*, 92; *Cleogene peletieraria*, 152; *Crambus luctiferellus*, 274; *Crambus couloneilus*, 274; *Cyclopides palaemon* and *C. sylvius*, 14, 30, 32 (plates and figures); *Nepticula acetosae*, 249; *Ochsenheimeria vacuella*, 92; *Odezia atrata*, 224 (plate); *Ophiodes lunaris*, 212; *Ourapteryx sambucaria*, 201; *Polygonia c-album* 39
- ERRATA AND CORRECTIONS 72, 124, 272, 311
- GENERA, SPECIES, VARIETIES, AND ABERRATIONS NEW TO SCIENCE:—*Agriades bellargus* ♀ ab. *coelestes*, Oberthür, 70; *Angerona prunaria* ab. *nigrolineata*, de Joannis, 96; *Anthrocera eulans* ab. *semi-striata*, Tutt, 274; *A. trifolii* ab. *ruficincta*, Tutt, 248; ab. *obscura*, Tutt, 23, 268, 309; *Argygnis adippe* ab. *cleodoxa-fulvescens*, Tutt, 222; ab. *cuneata*, Tutt, 222; *Biston hirtaria* ♀ ab. *terroraria*, Kroul., 121; *Brachypeza radiata*, Jenkinson, 147; *Brenthis pales* ab. *pallida*, Tutt, 206; *Bupalus piniarius* ♀ ab. *fuscantaria*, Kroul., 121; *Catocala promissa* var. *hilaris*, Oberthür, 45; *C. sponsa* var. *lacta*, Oberthür, 45; *Chattendenia*, Tutt, 143; *Coenonympha pamphilus* ab. *semityllus*, Kroul., 121; *C. tiphon* ab. *posterogrisea*, Tutt, 271; *Colias hyale* var. *supercavanea*, Kroul., 121; *Coremia ferrugata* ab. *standi*, Kroul., 121; *Dryas paphia* var. *dives*, Oberthür, 70; *Dysstroma* (*Cidaria*) *concinnata*, Steph., 143; *Earias chlorana* ab. *flavimargo*, de Joannis, 96; *Enodia hyperanthus* ab. *semialbescens*, Tutt, 247; *Epinephele ianira* ab. *dextroalbescens*, Tutt, 221; ab. ♀ *huenei*, Kroul., 121; ab. *illuminata*, Kroul., 121; ab. *ocellata*, Tutt, 247; *Ephyra punctaria* ab. *radiomarginata*, de Joannis, 96; *Erebia euryale* ab. *virgata*, Tutt, 206; *E. pronoe* ab. *ochracea*, Tutt, 206; ab.

- pallescent*, Tutt, 206; ab. *virgata*, Tutt, 206; *Exaleochara*, Keys, 5; *Exallonyx fumipennis*, Keif., var. *donisthorpei*, Keif., 106; *E. wasmanni*, Keif., var. *sociabilis*, Keif., 106; *Gampsocleis annae*, Shug., 142; *G. podolica*, Shug., 142; *Gastropacha* hybr. *veris*, Lenz, 96; *Gonodontis bidentata* ab. *edentula*, Kroul., 121; *Hydroecia crinanensis*, Burrows, 184; *Laccobius purpurascens*, Newbery, 43; *Larentia montanata* ab. *continuata*, Kroul., 121; *Macrothylacia rubi* ♀ ab. *transfuga*, Kroul., 121; *Melitaea phoebe* ab. *confusa*, de Joannis, 96; *Miana strigilis* ab. *amoena*, Kroul., 121; *Miselia carbonifera*, Hampson, 94; *Nemoria viridata* ab. *caerulescens*, Burrows, 133; ab. *concavilinea*, Burrows, 133; ab. *olivaceo-marginata*, Burrows, 133; ab. *rufotincta*, Burrows, 132; *Nepticula erythrogenella*, Demaison, 45; *N. spinosella*, Demaison, 45; *Nonagria edelsteni*, Tutt, 164, 167, 168, 268, 286, 309; *Ornithopsylla laetitiae*, Roths., 241; *Pelurga comitata* ab. *ferruginascens*, Kroul., 121; *Phora albicans*, Wood, 218; *P. campestris*, Wood, 218, 241; *P. dubitalis*, Wood, 218; *P. emarginata*, Wood, 218; *P. flavicauda*, Wood, 267; *P. fuscinervis*, Wood, 218, 241; *P. intermedia*, Malloch, 241; *P. paludosa*, Wood, 218, 241; *P. retroversa*, Wood, 218, 241; *P. rufa*, Wood, 218; *P. spinigera*, Wood, 218, 241; *Pieris rapae* ab. *praeterita*, Kroul., 121; *Plusia festucae* ab. *marisola*, Kroul., 121; *P. orophila*, Hampson, 94; *Polyommatus orbitulus* ab. *albipuncta*, Tutt, 274; ab. *obsoleta*, Tutt, 274; ab. *sinepuncta*, 274; ab. *unipuncta*, 274; *Pontia daplidice* var. *jachontovi*, Kroul., 121; *Protagrotis nicholli*, Hamps., 94; *Pseudoterpna pruinata* var. *viellata*, Kroul., 121; *Raywardia*, Tutt, 143; *Rumia luteolata* ab. *flavissima*, Kroul., 121; *Stangeia*, Tutt, 53; *Strymonidia*, Tutt, 143; *Sunius lyonesius* ab. *augustatus*, Joy, 229, 241; *Tapinotola hellmanni* ab. *expressata*, Kroul., 121; *Thais cersyi* var. *louristana*, Le Cerf, 70; *Troides alexandrae*, Roths., 71; *Venilia macularia* ab. *transversaria*, Kroul. 121
- LARVE OF:—*Caltigenia miniata*, 148; *Celastrina argiolus*, 270; *Cleogene peletieraria*, 153; *Labidostomis tridentata* (plate), 108; *Nemoria viridata* (plate), 134; *Nepticula acetosae*, 250; *Nola cristulalis*, 213; *Nudaria senex*, 148; *Odezia atrata*, 260; *Prionocyphon serricornis* (plate) . . . 109
- NOTABLE CAPTURES:—*Acidalia immorata*, 228; *Adkinia graphodactyla*, 271; *Aegeria andrenaeformis*, 11, 24, 71, 148, 187, 270; *A. scoliaeformis*, 12; *Agrilus biguttatus*, 237, 268; *Anosta archippus*, 237; *Anthrocera* (abnormal) (?), 24; *A. trifolii* ab. *obscura*, 268, 309; *Apium semivittatum*, 6; *Aphona nigriceps*, 229; *Arena octavii*, 6; *Bledius femoralis*, 185; *Brontes planatus*, 62; *Celerio gallii*, 272; *Ceuthorrhynchidius posthumus*, 6; *Colias edusa*, 239; *Crymodes exulis*, ♀, 242, 269; *Cryptocephalus bipunctatus*, 208; *C. exiguus*, 209; *C. lineola*, 208; *C. sexpunctatus*, 209; *Cryptomorpha desjardinsi*, 269; *Cryptophagus cylindricus*, 6; *C. lovendali*, 147; *Cucullia gnaphalii* (larvæ) 13; *Dorytomus tremulae*, 6; *Ennomos autumnaria*, 64, 68; *Epirrita autumnata*, 29, 67; *Euplectus minutissimus*, 6; *Habrostola tripartita* ab. *urticae*, 18; *Harpulus cupreus*, 285; *Hellinsia carphodactyla*, 18, 145, 186; *Hister marginatus*, 6; *Hydrobius fuscipes* ab. *chalconatus*, 184; *Hydrochus nitidicollis*, 6; *Hypera tigrina*, 6; *Hyponomeuta rorellus*, 267; *Ideoceras scarra*, 243, 269; *Leucania favicolor*, 13, 242; *L. vitellina*, 271; *Lomechusa strumosa*, 7; *Magdalis duplicata*, 6; *Malachius barnevillei*, 6; *Manduca atropos*, 239, 296; *Medon castaneus*, 6; *Melanippe fluctuata* ab. *costorata*, 24, 62; *Melanophthalma similata*, 6; *Mellinia ocellaris*, 23; *Nonagria edelsteni*, 268, 309; *N. sparganii*, 271; *Notodonta tritophus*, 147; *Notozus panzeri*, 215; *Odontia dentalis*, 186; *Oedemera virescens*, 6; *Onthophilus sulcatus*, 6; *Oxylaemus variolosus*, 6; *Phymatodus lividus*, 215; *Phytosus balticus*, 6; *Pyratis leinigialis*, ♀ (at light), 71; *Pyrameis virginienensis* (huntera) 122; *Quedius longicornis*, 6; *Q. riparius*, 6; *Q. vexans*, 6; *Rhizophagus coeruleipennis*, 6; *Rhytidomus globulus*, 215; *Sematochlora metallica*, 269; *Sirex juvenecus* (? , noctilio), 19, 63, 91, 92, 215, 243; *Stauropus fagi*, 271; *Sterrha sacchara*, 271; *Sympetrum fonscolombii*, 269; *Tortrix pronubana*, 72; *Trichonyx sulci-collis*, 6; *Trogolinus anglicanus*, 230, 268; *Xantholinus distans* 184
- OBITUARY:—Charles T. Bingham, F.Z.S., F.E.S., 267; John T. Carrington, 96, 123; Arthur John Chitty, M.A., F.E.S., 21, 45; Nicholas Frank

- Dobrée, 48; Pierre Adrien Prosper Finot, Chevalier de la Légion d'Honneur, 147, 218 (portrait); F. F. Freeman, F.E.S., 123; Alfred Giard, 218; Herbert Goss, F.E.S., 70; Martin Jacoby, F.E.S., 47; Henry Guard Knaggs, M.D., F.L.S., 48; Frederick C. Lemann, F.E.S., 96; William Henry E. Thornthwaite, F.R.A.S., 191; Canon Zapater .. 69
- PUPÆ OF:—*Adkinia graphodactyla*, 214; *Argynnis aglaia*, 266; *Cleogene peletieraria*, 158 (plate); *Lycaena arion*, 271; *Marasmarcha lunaedactyla*, 53; *M. tuttodactyla*, 53; *Odezia atrata*, 263; *Prionocyphon serricornis* (plate) .. 109
- REVIEWS AND NOTICES OF BOOKS:—"Acridium, Sur le Genre" (*Ann. de la Société Entomologique de France*) P. A. P. Finot, 81; *Aquatic Coleoptera of the Norfolk Broads*, F. Balfour-Browne, M.A., 10; *Biting-flies of India*, A Preliminary Account of, H. Maxwell-Lefroy, M.A., F.E.S., 69; *Bolletino del Laboratorio di Zoologia Generale e Agraria*, vol. i, 69; vol. ii, 189; *British Flies*, G. H. Verrall, F.E.S., vol. ii, 45; *Bulletin de la Société Lépidoptérologique de Genève*, iii, (Professor) C. Blachier, 190; *Darwinism to-day*, (Professor) Vernon L. Kellogg, 43; "Diaposematism, with reference to some limitations of the Müllerian Hypothesis of Mimicry, On" (*Trans. Ent. Soc. Lond.*), Guy Marshall, F.E.S., 189; *Evolution and Animal life*, (Professors) D. S. Jordan and V. L. Kellogg, 43; *Forest Entomology*, A. T. Gillanders, F.E.S., 209; "Incisalia, Studies of the Genus," J. H. Cook, 21; *Insects of the Sarnian Islands, The Non-British*, W. H. Luff, F.E.S., 218; *Lepidoptera and other Insects observed in the Parish of Mortehoe, N. Devon*, Dr. G. Longstaff, 21; *London Catalogue of British Plants*, 10th edition, F. J. Hanbury F.L.S., F.E.S., 95; *Moths of the British Isles, The*, R. South, F.E.S., 43; *Natural History of the British Butterflies, The*, vol. ii, J. W. Tutt, F.E.S., 44, 123, 159, 180; *Palearctic species of the genus Zygaena, The*, C. Dziurzynski, 218; *Practical Hints for the Field Lepidopterist*, Part i, second edition, J. W. Tutt, F.E.S., 113; *Predvaritelnyi Obzor Evraziatskikh Roda Gampsocleis*, etc., A. M. Shugurov, 142; *Proceedings of the South London Entomological and Natural History Society, The*, 1907-8, 188; *Report and Proceedings of the Lancashire and Cheshire Entomological Society, Thirty-first Annual*, 188; *Revisio Conocephalidarum*, H. Karny, 16; *Schmetterlings-fauna von Hildesheim, Die*, Wilhelm Bode, 45; *Senses of Insects, The*, August Forel, translated by MacLeod Yearsley, F.R.C.S., 244; *Souvenir of the Oroya Railroad, A*, (Rev.) A. M. Moss, M.A., 191; *Survey and Record of Woolwich and West Kent, A*, 94; *Tortricidae and their types—The genera of the*, (Professor) C. H. Fernald, 190; *Transactions of the Entomological Society of London (Coleoptera)*, 1907 .. 7
- SOCIETIES' REPORTS:—Birmingham Natural History Society, 191, 307; City of London Entomological Society, 24, 71, 243, 271, 309; Entomological Society of London, 21, 70, 71, 120, 148, 268, 306; Lancashire and Cheshire Entomological Society, 121, 271; South London Entomological Society .. 23, 121, 148, 192, 242, 270, 310
- | | PAGE. | | PAGE. |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|
| Aberration of <i>Celastrina argiolus</i> , 120; of larva of <i>Papilio machaon</i> , .. 240, 266 | | tera, Dry examination of, 188; of gynandromorphous hybrids, 268, 309; Study of, confirming former observations .. 146 | |
| Abstinence of female ants .. 281 | | Ants and Lycænid larvæ, Connection between, 89, 191; care of Aphides, 281; Dual founders of colonies, 281; Enemies of, 283; Found in Kew Gardens, 71; Seed food of .. 282 | |
| <i>Acridium</i> , The genus .. 81 | | Ants' nests and inhabitants, 7, 19, 56, 63, 119; Two supposed beetles of .. 108 | |
| Advice to young Mothers .. 310 | | <i>Apion</i> , The genus .. 252 | |
| Æstivation of some Coleoptera .. 10 | | Asymmetrical and melanic aberration of <i>Melanippe sociata</i> .. 217 | |
| Albinism in <i>Agriades corydon</i> , 20; <i>Brenthis euphrosyne</i> , 243; <i>Catopsilia catula</i> , 148; <i>Delius eucharis</i> , 148; <i>Epinephele ianira</i> , 24, 148, 271, 310 (twice); <i>E. tithonus</i> , 24; <i>Urbicola comma</i> .. 24 | | Asymmetry in genitalia of <i>Marasmarcha</i> (plate) .. 50 | |
| Alien visitors, Their right to a place in the British List .. 87 | | Assembling of <i>Dimorpha versicolora</i> , 145; of <i>Lithosia lutarella</i> 195 | |
| Amber, Insects found in .. 148 | | | |
| Ancillary appendages (genitalia) of <i>Cleogene</i> (plate), 152; <i>Marasmarcha</i> (plate), 53; of Lepidop- | | | |

	PAGE.		PAGE.
Attracting <i>Hadena glauca</i> by cut flowers	13	nymph of an <i>Agrion</i> , 306; in <i>Phrygania grandis</i> , 306; in pupa of <i>Adkinia graphodactylus</i> , 214; Genetic development of pigment, 115; in pupæ of <i>Euchloë cardamines</i> , 271; of Blue butterflies, 114; Parallelism of variation in related species, 149, 169; Seasonal of <i>Hellinsia carphodactyla</i> , 145; sexual, absent in some Lycenids, 116; variation of, in Lepidoptera, Causes of, 83; Warning, failure of	115
Beetles, Two new imported	34	Comparison of <i>Cleogene peletieraria</i> with <i>C. nivearia</i> , 152; eggs of <i>Adopaea</i> with <i>Cyclopides</i> , 14, 30; <i>Everes argiades</i> with <i>E. coretas</i> (<i>alcetas</i>), 78, 79, 148, 231, 264; <i>Nonagria neurica</i> with <i>N. edelsteni</i> , 164, 167, 168, 268, 286, 309; <i>Marasmarcha tuttodactyla</i> with <i>M. lunadactyla</i>	51
Bibliography of the generic name <i>Botys</i> , 141; of <i>Nonagria neurica</i> , Hb.	166, 268, 309	<i>Conocephalidae</i> , The	16
Billberg's Geometrid genera	204	Continental authorities not always trustworthy	5
Birmingham, Natural History and Philosophical Society 50th Anniversary, 207: Reception, 307; Work of	122	Conversazione of Entomological Society of London	94, 162
Bogs, Lepidoptera of	246, 278	Copying	130, 161
<i>Botys</i> , The generic name	141	Courtship of <i>Hepialus humuli</i>	202
Brachypterous <i>Cryptinae</i> , Table of genera and species	34, 35	Crosspairing of <i>Anthrocera achilleae</i> with <i>A. purpuralis</i> , 93; <i>Callosamia promethea</i> with <i>Philosamia cynthia</i> , 120; <i>Lathridius angulatus</i> with <i>Corticaria crenulata</i>	229
Breeding <i>Pronocyphon serricornis</i>	109	<i>Cucullia</i> , Species of, in Britain	121
<i>Brenthis amathusia</i> , Some notes on	138	<i>Cryptocephali</i> , A few Notes on	208
"British List, The"	87	Cyanide-Bottles for Killing	256
British Records of <i>Sirex juvenis</i> (? <i>S. noctilio</i>) 19, 63, 91, 92, 215,	243	Damage done to <i>Euonymus europæus</i> by larvæ of <i>Hyponomeuta cagnagellus</i> , 185, 216; to foliage by larvæ of <i>Odontopera bidentata</i> , 146; to laburnum by <i>Cemistoma laburnella</i> , 216; to sallow by <i>Leucoma salicis</i> , 50; to vegetation in America	95
Broods, First, of <i>Agrotis puta</i> , 185; Second of <i>Abraxas grossulariata</i> , 270; of <i>Acidalia humiliata</i> , 272; <i>Apecta herbida</i> , 272; <i>Boarmia repandata</i> var. <i>conversaria</i> , 272; <i>Cyaniris semiargus</i> , 217; <i>Eumorphia elpenor</i> , 270; <i>Melampias epiphron</i> , 24; <i>Platyptilia gonodactyla</i> , 238; <i>Thera firmata</i> , 270; Third of <i>Celastrina argiolus</i> , 310; of <i>Cemistoma laburnella</i> , 216; number of, in <i>Hyponomeuta cagnagellus</i> , 238; Overlapping, in <i>Leptosia sinapis</i> , 126; Numerical abundance in <i>Polygonia c-album</i> , 40; of <i>Tortrix pronubana</i>	72	Daylight flight of <i>Celerio gallii</i>	55
Butterflies attacked by birds, 114, 239, 254; by wasps	40	Dehiscence of <i>Cleogene peletieraria</i>	158
Butterflies of Hungary, 192; Pyrenees (1907), 176; The Rhone Valley (Spring), 74; Swiss in 1907, 54; in 1908	300	Diagnosis of forms of <i>Anthrocera achilleae</i> , 74; of Brachypterous <i>Cryptinae</i> , 34; of <i>Euplectus bescidicus</i> and <i>E. duponti</i> , 56; of <i>Marasmarcha tuttodactyla</i> and allied species (plates), 50; of genus <i>Olophrum</i> , 256; of genus <i>Philhydrus</i> (plate)	25
Carrión beetles	7	Distinctness of <i>Everes argiades</i> , <i>E. dipora</i> , and <i>Binghamia parrhasius</i>	301
Characteristics of <i>Marasmarcha tuttodactyla</i>	51	Donation to Entomological Society of France, Private	309
Chin-glands of larvæ	253	Drinking-Habits of Butterflies, 97, 98, 149, 251; of <i>Ennychia octomaculata</i> , 98; of Moths of the genus <i>Catocala</i>	93
Christmas cards	20		
City of London Entomological Society, Officers for 1908	24		
Classification of Forms of <i>Anthrocera achilleae</i> , 74; of Brachypterous <i>Cryptinae</i> , 35; of genus <i>Olophrum</i> , 256; of the genus <i>Philhydrus</i> , 27; of the <i>Ruralides</i>	183		
Cocoons, Composite in Lepidoptera	70		
Coleoptera, Aestivation of some, 10; Alien, taken in Britain, 62, 87; Enemies of, 7; in the Isle of Wight, 229; in Lundy Island, 6; in St. Kilda, 6; rare, 6; to be removed from British List, 3,	99		
Colour, Change of, in covering of			

	PAGE.
<i>Drosera</i> -feeding "Plumes" ..	69
Drying cabinet insects, Importance of ..	114
Early appearance of <i>Pieris rapae</i> , ..	119
Early stages of <i>Heodes virgaureae</i> ..	212
Ecdysis of <i>Nepticula acetosae</i> larvæ ..	251
Eggs of <i>Ennomos tiliaria</i> , Irregular hatching of, 187; of <i>Coleophora</i> , 243; of <i>Cyclopides palaemon</i> , <i>C. sylvius</i> , and their Thymeline affinities (3 plates), 14, 30; Upright of Geometrids, 200, 240; upright or flat, Importance of study of ..	14
Egg-cases of <i>Cassididae</i> , Purpose of ..	9
Egg-laying see Oviposition.	
Elder (<i>Sambucus</i>) attractive to <i>Gracilaria syringella</i> , 145; corrected ..	187
Emergence dates of <i>Oporabia</i> var. <i>filigrammaria</i> and <i>O. autumnata</i> , 29; from pupa, of <i>Aegeria culiciformis</i> and <i>Trochilium crabroniformis</i> , 192; of <i>Pararge egeria</i> , Irregular, 71; from egg of <i>Polygonia c-album</i> , protracted, 36; time, of <i>P. c-album</i> , 30; of <i>Sesia andrenaeformis</i> ..	11
Enemies of <i>Cleoceris viminalis</i> ..	297
Entomological Club Meetings, 42, ..	95
Entomological Society of London, Conversazione, 94, 162; Council for 1909, 307; Meetings, 20, 70, 71; Standing Business and Publication Sub-Committee ..	268
<i>Eupithecia tamarisciana</i> as a British insect ..	102, 144
Exhibition of Lepidoptera at Geneva ..	171
Fauna of Bogs ..	246, 278
Feeding-habits of <i>Cyclopides palaemon</i> , 77; of <i>Bithys quercus</i> , New, 222; of <i>Aporia crataegi</i> ..	125
Female lepidoptera at light ..	64, 71
Flight-time of <i>Adopaea lineola</i> , 296; of <i>Strenia clathrata</i> , 298; of <i>Tapinostola hellmanni</i> ..	297
Food for Glow-worm ..	148
Food-plants of:— <i>Aegeria formiciformis</i> , 12; <i>Acidalia virgularia</i> , 65; of Argynnids, Necessary condition of, 138; <i>Argyrolepis</i> (<i>Phalonia</i>) <i>badiana</i> , 91; <i>Bithys quercus</i> , 93; <i>Catocala conversa</i> , 93; <i>C. dilecta</i> , 93; <i>C. nymphagoga</i> , 93; <i>C. promissa</i> , 93; <i>Cleogene peletieraria</i> , 151, 153; <i>Coenonympha tiphon</i> , 246; <i>Cor-emia ferrugata</i> , 310; <i>Epidemia epixanthe</i> , 94; <i>Incisalia polios</i> , 21; <i>Lampides boeticus</i> , 140; <i>Marasmarcha tuttodactyla</i> , 51;	

	PAGE.
<i>Mellinia gilvago</i> , 240; <i>Nemoria viridata</i> , 130, 243; <i>Nepticula acetosae</i> , 248; <i>Oporabia autumnata</i> , 29; <i>Polygonia c-album</i> , 40; <i>Porthetria</i> (<i>Lymantria</i>) <i>dispar</i> , 93; <i>Plusia moneta</i> , 214; <i>Trichiura crataegi</i> , 20; <i>Tortrix pronubana</i> , 213; <i>Xanthia cerago</i> ..	240
<i>Formica sanguinea</i> in the Midlands ..	63, 119, 238
"Forward," larvæ of <i>Arctia villica</i> , 66; <i>Cyaniris semiargus</i> ..	217
Fungoid growth upon <i>Hepialus humuli</i> after death, 120; on larvæ of <i>H. lupulinus</i> ..	120
<i>Gampsocleis</i> , The genus ..	142
Generic names, Preoccupied, Replaced ..	143
Genitalia of <i>Cleogene</i> (plates), 152; of Lepidoptera, dry examination of, 188; of <i>Marasmarcha</i> (plates), 53; Serviceable in distinguishing different species of <i>Everes</i> , 148, 232; Study of, confirming former observations ..	146
Geographical bearing of variation in size in <i>Polyommatus icarus</i> ..	144
Geometrid genera, Billberg's ..	204
Geometrides of Wimbledon Common ..	60
Glands of Lycænid larvæ, 89; of Pierid larvæ ..	253
Grasshoppers, British, Characteristics of ..	276
Gynandromorphic:— <i>Agriades bellargus</i> (?) 71; <i>Crocallis elinguaris</i> , 24; <i>Parnassius apollo</i> , 178; <i>Pieris napi</i> , 269; <i>Saturnia pavonia</i> , 67; <i>Trichiura crataegi</i> , 270; <i>Troides haliphron</i> ..	72
Gynandromorphism in hybrid Sphinges, Degrees of ..	268, 309
Habit, "Forward," of larvæ of <i>Arctia villica</i> ..	66
Habitats of:— <i>Coenonympha tiphon</i> , 245, 278; <i>Cryptophagus</i> , 3; <i>Erebia gorge</i> , 274; Some water-beetles in summer ..	10
Habits, drinking, of Butterflies, 98, 149, 151; <i>Enmychia octomaculata</i> , 98; Moths of the genus <i>Catocala</i> ..	93
Habits, feeding, of <i>Aporia crataegi</i> , 125; <i>Bithys quercus</i> , 222; <i>Cyclopides palaemon</i> ..	77
Habits, larval, of <i>Adkinia graphodactyla</i> , 174; <i>Aglais urticae</i> , 40; <i>Aporia crataegi</i> , 145; <i>Argynnis aglaia</i> , 266; <i>Argyrolepis badiana</i> , 91; <i>Brenthis amathusia</i> , 138; <i>Cyaniris semiargus</i> , 217; <i>Cleogene peletieraria</i> , 151;	

PAFÉ.	PAGE.
<i>Cyclopides palaemon</i> , 65, 77;	<i>gonia c-album</i> (larva), 36; <i>Pyra-</i>
<i>Heodes virgaureae</i> , 212; <i>Labidostomis tridentata</i> , 108 (plate);	<i>meis atalanta</i> 41, 186
<i>Leucoma salicis</i> , 145; <i>Nemeobius lucina</i> , 254; <i>Nepticula acetosae</i> , 250; <i>N. erythrogenella</i> , 45; <i>N. spinosella</i> , 45; <i>Nola cristulalis</i> , 213; <i>Odezia atrata</i> , 260; <i>Odontia dentalis</i> , 186; <i>Pericallia syringaria</i> , 67; <i>Polygonia c-album</i> , 37; <i>Prionocyphon serricornis</i> (plate) 109	Hybrid Sphingids 202, 268
Habits, Pairing: <i>Aglias urticae</i> , 29; Butterflies (sexes carried), 240; <i>Dimorpha versicolora</i> , 145; <i>Dryas paphia</i> , 254; <i>Empis livida</i> , 218; <i>Leucoma salicis</i> , 135; <i>Myrmedonia humeralis</i> , 283; of insects, delayed, 12; Repeated, in Lepidoptera 254	<i>Hydroecia</i> , The British Species of the Genus 146, 184
Habits, Pupation, of: <i>Adkinia graphodactyla</i> , 175; <i>Agriades bellargus</i> , 243; <i>Amorpha populi</i> , 63; <i>Anthrocera hippocrepidis</i> , 23; <i>Argynnis aglaia</i> , 266; <i>Cleogene peletieraria</i> , 159; <i>Eurrhynpara urticata</i> , 63; <i>Gonepteryx rhamni</i> , 254; <i>Lampides boeticus</i> , 140; <i>Lycaena arion</i> , 271; <i>Nemoria viridata</i> , 131; <i>Nola cristulalis</i> , 214; <i>Odezia atrata</i> , 263; <i>Polygonia c-album</i> 39, 125	<i>Ichneumons</i> , Liability to, of <i>Aegeria andrenaeformis</i> , 24; <i>Hellinsia carphodactyla</i> , 187; <i>Melitaea aurinia</i> , 68; <i>Sesia stellatarum</i> 125
Habits, Resting, of: Butterflies at night, 195; Butterflies during rain, 138; <i>Hemerophila abruptaria</i> , 145; <i>Hyria auroraria</i> , 33; <i>Lepetostia sinapis</i> , 64; <i>Lycænid</i> , 116; <i>Melitaea didyma</i> , 137; <i>M. var. varia</i> , 301; <i>Nemoria viridata</i> , 131, 132; <i>Parnassius apollo</i> .. 137	Identity of, <i>Nonagria neurica</i> , Hb., with <i>N. arundineta</i> , Schm. 164, 268, 286
Hatching of eggs of: <i>Cyclopides palaemon</i> , 65; <i>Ennomos tiliaria</i> , protracted, 187; <i>Polygonia c-album</i> , protracted, 36; <i>Pyrameis atalanta</i> 192	<i>Ilex</i> , Lepidoptera feeding upon .. 93
Hawthorn-flower-feeding "Pug" larvæ 30	Immigration of dragon-flies into Channel Islands, 215; <i>Lampides boeticus</i> into the Channel Islands, 139; of <i>Pieris brassicae</i> 239
<i>Heliopsis</i> , European specimens, wanted 119	Imported insects 34, 62, 87
<i>Heodes virgaureae</i> , Notes on the early stages of 212	Insecticides 146
Hybernating stage of the Argynnid and Brenthid group of Fritillaries 226	Kent, North, Fauna of, 30 years ago 270
Hybernation of: <i>Aporia crataegi</i> (larvæ), 145, 186; <i>Argynnis adippe</i> , 192; <i>A. aglaia</i> , 192; <i>Brenthis amathusia</i> (larva), 138; <i>Cyaniris semiargus</i> (larva), 217; <i>Dryas paphia</i> , 192; <i>Epidemia epixanthe</i> , 94; <i>Heodes virgaureae</i> (egg), 212; <i>Leucoma salicis</i> , 145, 186; <i>Limenitis sibylla</i> , 310; <i>Odezia atrata</i> (egg), 225; <i>Poly-</i>	Killing-bottles, Cyanide 256
	Labelling Insects, Importance of 114
	Larva of, <i>Triana psi</i> , Abnormal 243
	Larva-collecting at Bellingham, 19; in Fermanagh 29
	Larvæ, "Forward" of, <i>Arctia villica</i> , 66; <i>Cyaniris semiargus</i> .. 217
	Larvæ, Irregularity in the feeding-up of, when kept under identical conditions, 186; of <i>Macrothylacia rubi</i> , eaten by gulls 120
	Larval depredations on tops of trees, 186; of <i>Hyponomeuta cagnagellus</i> on <i>Euonymus europæus</i> 185
	Larval glands of Pierids 253
	Larval habits of, <i>Adkinia graphodactyla</i> , 174; <i>Aglais urticae</i> , 40; <i>Aporia crataegi</i> , 145; <i>Argynnis aglaia</i> , 266; <i>Argyrolepis badiana</i> , 91; <i>Brenthis amathusia</i> , 138; <i>Cyaniris semiargus</i> , 217; <i>Cleogene peletieraria</i> , 151; <i>Cyclopides palaemon</i> , 65, 77; <i>Heodes virgaureae</i> , 212; <i>Labidostomis tridentata</i> (plate), 108; <i>Leucoma salicis</i> , 145; <i>Nemeobius lucina</i> , 254; <i>Nepticula acetosae</i> , 250; <i>N. erythrogenella</i> , 45; <i>N. spinosella</i> , 45; <i>Nola cristulalis</i> , 213; <i>Odezia atrata</i> , 260; <i>Odontia dentalis</i> , 186; <i>Pericallia syringaria</i> , 67; <i>Polygonia c-album</i> , 37; <i>Prionocyphon serricornis</i> (plate) .. 109
	Larval period, Extended of <i>Nemoria viridata</i> 131
	Larval preferences of Argynnids, 138; of <i>Larentia caesiata</i> , 18; of <i>Oporabia filigrammaria</i> 18
	Larval varieties of <i>Papilio machaon</i> , 240, 266
	Late appearance of Lepidoptera in

	PAGE.		PAGE.
1907, 19; of <i>Rumicia phlaeas</i> ..	266	Melanism in <i>Amphidasys betularia</i> , A biological enquiry into nature of (plate) ..	41
"Leaf Insect," Early Chinese description of ..	93	Melanism, Proportionate, in a brood of <i>Aplecta nebulosa</i> , 307; progressive in <i>Polia chi</i> , 272; in Lepidoptera ..	85
Leg-spurs of "Plume" moths, Use of ..	69	Melanochroism, produced by humidity and heat ..	173
Lepidoptera, Notes on, during the season of 1907 ..	11	Mendelian inheritance in broods of yellow <i>Callimorpha dominula</i> 243, 269	
Lepidoptera of the bogs above the Züricher-See, 245, 278; The Grisons, 193, 194, 205, 221, 275; North Kent, 186; The Pyrenees, 151, 222 (plates); Ticino, 49, 97, 106, 125, 135, 149; Wicken Fen, 294		Micromorphic <i>Epinephele ianira</i> , 24; <i>Meloë proscarabaeus</i> , 21; <i>Parnassius apollo</i> ..	91
Lepidopterological Notes on the Season of 1907 at Burnley, 17; from Dereham, 119; from Co. Fermanagh, 29; from Hailsham, 227; In 1908 ..	254	Microple, Importance of, in study of ova ..	14
Lethargy of both sexes of <i>Lymantria monacha</i> , 221; of <i>Porthetria dispar</i> ♀ ..	221	Migration of Dragonflies, 215; <i>Lampides boeticus</i> , 139; <i>Pieris brassicae</i> ..	239
Life, Length of imaginal, in <i>Scolio- teryx libatrix</i> ..	297	"Mimicry" ..	189
Life-histories of <i>Adkinia grapho- dactyla</i> , 174; <i>Chattendenia (Edwardsia) w-album</i> , 159; <i>Cleo- gene peletieraria</i> , 151; <i>Collyris emarginatus</i> , 8; <i>Cyclopides palaemon</i> , 65; <i>Labidostomis tridentata</i> , 108; <i>Lampides boeticus</i> , 139; <i>Nepticula acetosae</i> , 248; <i>Polygonia c-album</i> , 37, 309; <i>Prionocyphon serricornis</i> , 108; <i>Tetrobius gabrielii</i> , 9; <i>Tortrix pronubana</i> , 72; necessary in- complete ..	69, 149	Mistletoe growing upon fir ..	54
Light, Effect of deprivation of, in rearing lepidoptera, 22; little attractive to <i>Leucoma salicis</i> , 135; Lepidoptera at ..	61, 295	Müllerian Hypothesis of Mimicry, Some limitations of ..	22, 72
Local races ..	106, 169, 171	Muscular power possessed by larvæ of <i>Cossus ligniperda</i> ..	266
Locality, Most northern, for <i>Biston hirtaria</i> ..	120	Museum theories ..	190
Lycenid larvæ and ants, Connec- tion between ..	89, 191	"Mutations," Sudden "leaps" to melanism so-called ..	85
Malformation in lepidoptera ..	173	Myrmecophilus coleoptera, 7; Notes from Midlands in 1907, 56; in 1908 ..	281
Melanic, <i>Amphidasys betularia</i> , 61, 207; <i>Anthrocera trifolii</i> , 23; <i>Aplecta nebulosa</i> , 272; <i>Boarmia repandata</i> , 272; <i>Brenthis eu- phrosyne</i> , 55; <i>Cheimatobia brumata</i> , 61; <i>Larentia caesiata</i> , 18; <i>Cleora glabraria</i> , 310; <i>Dryas paphia</i> , 243, 307; <i>Ennomos autumnaria</i> , 68; <i>Eupithecia absinthiata</i> , 20; <i>E. rectangulata</i> , 61; <i>Fidonia atomaria</i> , 61; <i>Gno- phos obfuscata</i> , 98; <i>Melanippe sociata</i> (asymmetrical), 217; <i>Melitæas</i> , 172; <i>Odontopera biden- tata</i> , 23; <i>Oporabia dilutata</i> , 61; <i>Polia chi</i> , 272; <i>Tephrosia conso- naria</i> ..	148	<i>Nemoria viridata</i> (plate) ..	128
		Nesting of <i>Formica rufa</i> ..	19
		Nomenclature of <i>Proctotrypidæ</i> , Drastic correction of ..	99
		<i>Nonagria neurica</i> , Hb., and <i>N. edelsteni</i> , Tutt 164, 167, 168, 268, 286, 309	
		Officers of the City of London Entomological Society for 1908, 24; of the Birmingham Natural History and Philosophical Society, 122, 191; of the Entomo- logical Society of London, for 1909 ..	307
		<i>Olophrum</i> , Table of Species of the Genus ..	256
		Orthoptera of East Kent, 275; of Holland, Belgium, and England, 117; of Western Europe, Synop- sis of ..	58, 110, 195, 257
		Osmateria of larvæ ..	253
		Ova of Lepidoptera, shape of, 14, 38; Variation in size of ..	16
		Oval, period of <i>Brenthis amathusia</i> , 138, 226; of <i>Cyclopides palaemon</i> , 65; of <i>Nemoria viridata</i> , 131; of <i>Polygonia c-album</i> ..	38
		Oviposition of:— <i>Acidalia immu- tata</i> , 240; <i>Aporia crataegi</i> , 64; <i>Araschnia levana</i> , 22; <i>Brenthis amathusia</i> , 138, 226; <i>Cassididae</i> , 9; <i>Coleophora virgaureae</i> , 310;	

	PAGE.		PAGE.
<i>Dryas paphia</i> , 254; <i>Labidostomis tridentata</i> , 108; <i>Leptidia sinapis</i> , 228; <i>Leucania trevilina</i> , 271, 307; <i>Leucoma salicis</i> , 50, 135; <i>Nephtula acetosae</i> , 249; <i>Ochsenheimeria vacuella</i> , 92; <i>Odezia atrata</i> , 225; <i>Ourapteryx sambucaria</i> , 200; <i>Polygonia c-album</i> , 37, 309; some ant's nest beetles 108		254; <i>Lampides boeticus</i> , 140; <i>Lycaena arion</i> , 271; <i>Nemoria viridata</i> , 131; <i>Nola cristulalis</i> , 214; <i>Odezia atrata</i> , 263; <i>Polygonia c-album</i> 39, 125	
Parasites of:— <i>Aegeria andrenaeformis</i> , 24; <i>Agrilus</i> , 268; Coleoptera (Hymenopterous), 8; <i>Gelechia brizella</i> , 100; <i>Hellinsia carphodactyla</i> , 187; <i>Melitaeta aurinia</i> , larvæ, 68; <i>Sesia stellatarum</i> , 125; of <i>Tortrix pronubana</i> , 148; of the "wood-louse," 231, 269		Pyrenees, Butterflies of the, 176; Notes from the 50, 222	
Parasitic fungi on flies 269		Races, Local 169	
Pale forms of:— <i>Boarmia repandata</i> , 122; <i>Cidaria testata</i> , 298; <i>Cosmotriche potatoria</i> 231, 295		Racial names, Proper use of 106	
Pairing, attempted between similar-looking species, 255; Delayed, 12; Repeated, in Lepidoptera .. 254		Rearing <i>Sesia andrenaeformis</i> , 11; <i>Tetropium gabrielii</i> 9	
Pairing habits of:— <i>Aglais urticae</i> , 29; Butterflies (sexes carried), 240; <i>Dimorpha versicolora</i> , 145; <i>Dryas paphia</i> , 254; <i>Empis livida</i> , 218; <i>Leucoma salicis</i> , 135; <i>Myrmedonia humeralis</i> , 283;		Reappearance of <i>Hecatera serena</i> at Blackheath 216	
<i>Philhydrus</i> :—On the British species of the genus (plate), 25; Table of 28		Reed and grass flowers, competing with sugar 295	
<i>Phora</i> , On the British species of .. 218		Reinstatement in British list of <i>Clambus punctulatum</i> , 293; <i>Hypnomenota rorellus</i> 267	
Pierid larvæ, Glands of 253		Relaxing-tin, Newman's 228	
"Plumes," First broods of some, 187; Use of leg-spurs of 69		Resting-habits of: butterflies at night, 195; during rain, 138; <i>Hemerophila abruptaria</i> , 145; <i>Hyria auroraria</i> , 33; <i>Leptosia sinapis</i> , 64; <i>Lycaenids</i> , 116; <i>Melitaeta didyma</i> , 137; <i>M. var. varia</i> , 301; <i>Nemoria viridata</i> , 131, 132; <i>Parnassius apollo</i> .. 137	
<i>Proctotrypidæ</i> , 57; Notes on Scotch and others, 99; Some new British 106		Retrospect of a Coleopterist for 1907 1	
Protection, Advantages or disadvantages of, to Lepidoptera .. 295		Röntgen Rays, Effect of, upon pupæ of lepidoptera 173	
Protective coloration of Blue Butterflies, 114; <i>Orthotylus rubidus</i> 231		<i>Ruralidae</i> , Table of classification of genera 183	
Predaceous insects and their prey, 7; Locust carrying a mouse .. 23		Sale of the Thornthwaite collection 242, 284	
Pugnacity of <i>Anax imperator</i> .. 306		Scent of <i>Myrmedonia</i> 283	
Pupæ, naked of ants 281		Season of 1907, Disappointing, 19; Lateness of 55	
Pupal coloration in <i>Euchloë cardamines</i> , affected by surroundings 271		Seasonal dimorphism, 189; Modified by character of season, 22, 71; of <i>Polygonia c-album</i> 37, 309	
Pupal stage, duration of in <i>Polygonia c-album</i> , 28-29; extended in <i>Emmelesia unifasciata</i> , 13; <i>Eupithecia dodoneata</i> , 30; <i>Moma orion</i> , 172; extension of, tending to cause melanochroism 172		Second-broods of <i>Abraxas grossulariata</i> , 270; <i>Acidalia humiliata</i> , 272; <i>Aplecta herbida</i> , 272; <i>Boarmia repandata</i> var. <i>conversaria</i> , 272; <i>Cyaniris semiargus</i> , 217; <i>Eumorpha elpenor</i> , 270; <i>Melampias epiphron</i> , 24; <i>Platyptilia gonodactyla</i> , 238; <i>Thera firmata</i> 270	
Pupation habits of:— <i>Adkinia graphodactyla</i> , 175; <i>Agriades bellargus</i> , 243; <i>Amorpha populi</i> , 63; <i>Anthrocera hippocrepidis</i> , 23; <i>Argynnis aglaja</i> , 266; <i>Cleogene peletieraria</i> , 159; <i>Eurrhynpara urticata</i> , 63; <i>Gonepteryx rhamni</i> ,		Seeds, <i>Myrmecochorus</i> 282	
		Sexual coloration in some <i>Lycaenids</i> 116	
		Sexual dimorphism exhibited in antennæ of Lepidoptera 94	
		Sexual selection practically non-existent among butterflies 115	
		Size, variation of <i>Polyommatus icarus</i> , geographical bearing upon 144	
		Sluggishness of <i>Lymantria monacha</i> (both sexes), 221; of <i>Porthetria dispar</i> (♀) 221	
		Société entomologique de Belgique—Presidential Address 44	

	PAGE.
South-Eastern Union of Scientific Societies	267, 308
Sparrows responsible for disappearance of insects	216
Specific distinctness of: <i>Calodera nigrita</i> and <i>C. protensa</i> , 241; <i>Evers argiades</i> and <i>E. coretas (alcetas)</i> , 78, 231, 264; <i>Satyrus alcyone</i> and <i>S. hermine</i>	187
Stages of <i>Leucoma salicis</i> , all found at same time	135
Stridulation of British grasshoppers	276, 277
"Sugar," 227; <i>Hypena proboscidalis</i> at	227
Synonymy of British Coleoptera, 4, 7; <i>Dystroma concinnata</i> , 143; <i>Evers alcetas</i> 223; <i>Nonagria neurica</i> and <i>N. edelsteni</i>	164, 286
Synopsis of the Orthoptera of Western Europe	58, 110, 195, 257
Table of Brachypterous <i>Cryptinae</i>	35
Temperature experiments on <i>Araschnia levana</i> , 21; Butterflies, 22, 172; <i>Pieris rapae</i>	309
Teratological specimens of <i>Argynnis aglaia</i> , 148; <i>Erebia aethiops</i> , 221; <i>Pytho depressus</i> , 306; <i>Melitaea deione</i> var. <i>berisalisensis</i>	54
Tineids of Wimbledon Common, Some	104
Transplanting of <i>Bankia argentula</i> to Wicken, Successful	296
Twilight protracted, and its effect upon night-flying lepidoptera	227
Type specimen of <i>Oxygastra curtisii</i>	148
Variation of <i>Agrotis agathina</i> , 271; <i>Anthrocera achilleae</i> , Table of,	

	PAGE.
74; <i>Argynnis aglaia</i> (larvæ), 266; Butterflies, 255; <i>Coenonympha tiphon</i> , 245; <i>Epinephele tithonus</i> , 24, 310; <i>Libellula quadrimaculata</i> , 269, 307; <i>Manduca atropos</i> (larva), 296; <i>Melitaea phoebe</i> , 106, 169; <i>Tortrix heparana</i> , 310; <i>Xylophasia rurea</i>	17, 41
Variation, Causes of, in Lepidoptera, 169; climatic conditions tending to produce variation in sexual dimorphism, 71; in Lepidoptera, a criticism, 83; in size of lepidoptera, the geographical bearing on	144
Vanessids, Notes from the Wye Valley on, in 1907	36
Vertical distribution of Lepidoptera	150
Vision of butterflies	255
Wasps, Method of attacking butterflies	40
Waxing and waning species of Lepidoptera	295, 298, 306
Wicken revisited	294
Wood-louse, Parasites of	231, 269
Wood-naphtha, Use of in examining genitalia of cabinet specimens	188
Xanthic, <i>Agriades corydon</i> , 20; <i>Epinephele ianira</i> , 24, 148, 271, 310 (twice); <i>E. tithonus</i> , 24; <i>Urbicolar comma</i>	24
Yellow aberrations of:— <i>Anthrocera achilleae</i> , 74; <i>A. carniolica</i> , 126; <i>A. exulans</i> , 270; <i>Callimorpha dominula</i> , 243, 269; <i>Euchelia jacobaeae</i>	172

LOCALITIES, ETC.:—Airolo, 49; Albula, 205; Almagel, 301; Bagnères de Luchon, 176; Biarritz, 179; Bella Tola, 55; Bellingham, 19; Benaughlin, 29; Bex, 76; Brugnasco, 97; Burnley, 17; Canigou, 178; Casteil, 176; Caux, 77; Chandolin, 55; Chippis, 54; Correl Glen, 29; Cumberland (coleoptera), 62; Deal, 13; Delamere Forest, 272; Dereham, 119; Ditchling (coleoptera), 252; Einsiedeln, 280; Enniskillen, 29; Fermanagh Co., 29; Gavarnie, 50, 179; Glion, 77; Grion, 76; Grisons, The, 193, 205, 221; Hailsham, 227; Holland, Belgium, and England (orthoptera), 167; Hospice de France, 178; Isle of Wight, 271; (coleoptera), 229; Kent East (lepidoptera), 64; (orthoptera) 275; Kent North, 186; Thirty years ago, 270; Kinloch-Rannoch, 12; La Bâtiaz, 77, 78; Lac de Mouriscot, 180; Lavey Woods, 75; Les Avants, 77; Lundy Island (coleoptera), 6; Martigny, 76; Midlands (coleoptera), 56; Mischabel, 301; Nervi, 254; New Forest, 64; Northumberland (coleoptera), 33; Pain Sec, 54; Piottino Gorge, 135; Piora, 149; Piotta, 125; Pontresina, 193; Port de la Piquade, 178; Preda, 205; Pyrenees, 50, 151, 176, 222, 260; Rhone Valley, 74, 78; Roseg Valley, 194; Saas Valley, 300; Sils, 222; Sierre (Switzerland), 54; Sion, 77; Sonciez, 77; Southend, etc., 63; Strela Pass, 273; St. Gothard Pass, 106; St. Moritz, 193; St. Nicolaus, 76; St. Triphon, 76; Switzerland Central (coleoptera), 270; Territet, 75, 77; Thusis, 221; Ticino, 49, 97, 106, 125, 135, 149; Tower of Goa, 177; Val Bedretto, 49; Vallée du Lys, 178; Vallée de Poueyespée, 179; Valley of St. Vincent, 177; Vernayaz, 77; Vérossaz, 77; Vernet-les-Bains, 176; Via Mala, 221; Vissoie, 54; Warrington Mosses, 272; Wicken Fen, 294;

Weisshorn, 55; Weissenstein, 207; Wimbledon Common (Geometrids), 60, (Tineids), 104; Wye Valley (Vanessids), 36; Zinal, 54, 55; Züricher See, 245, 278.

LIST OF CONTRIBUTORS.

Allen, J. E. R., M.A. 29	Joy, Norman K., M.R.C.S., F.E.S. 19, 56, 91
Anderson, Joseph W. 63	Keynes, G. L., B.Sc. 176
Andrews, H. W., F.E.S. 187	Keynes, J. N., M.A., D.Sc., F.E.S. 176
Bagnall, R.S., F.E.S. 33, 305 (twice)	Leigh, H. S. 41
Balfour-Browne, Frank, M.A., F.R.S.E., F.Z.S. 25	Lowe, F. E. (Rev.), M.A., F.E.S. 139, 213
Bankes, E. R., M.A., F.E.S. 19 (twice)	Luff, W. A., F.E.S. 215
Beare, (Prof.) T. Hudson, B.Sc., F.R.S.E., F.E.S. 1, 255	Manders, Lt.-Colonel, R.A.M.C., F.E.S. 202
Bennett, William, F.E.S. 146	Martineau, A. H., F.E.S. 56, 119
Bethune-Baker, George T., F.Z.S., F.L.S., F.E.S. 78, 186	Massey, Herbert, F.E.S. 144
Bird, J. F. 36	Minakata, Kumagusu 93
Blachier (Prof.), Charles 120, 171	Morley, Claude, F.E.S., 99, 100 (note), 101 (note)
Burr Malcolm, B.A., F.L.S., F.Z.S., F.E.S. 16, 58, 81, 110, 117, 142, 195, 218, 257, 275	Muschamp, P.A.H., F.E.S., 240, 266
Burrows, C. R. N. (Rev.), 113, 128, 184	Newman, L. W., F.E.S. 68
Butler, W. E., F.E.S. 145, 215	Nicholson, Charles 114
Capon, Edwin, 63	Nicholson, G. 19
Chapman, T. A., M.D., F.Z.S., F.E.S. 14, 30, 50, 65, 151, 222, 260, 264 (note)	Ovenden, J. 145, 186, 187 (twice)
Chitty, Arthur J. (the late) 99	Palin, Fred 119
Clark, J.A., F.E.S., 92, 215, 272 (note)	Pearce, W. S. 20
Clutton, W. G. 17, 20, 41, 119	Pearson, Douglas 54, 300
Cockayne, E. A., F.E.S. 73	Phillips, H. R., F.R.C.S., F.E.S. 217
Cochrane, A. M. (Miss) 66, 119, 145 (twice), 159, 189 (twice), 186 (thrice), 215	Powell, H., F.E.S. 93 (twice)
Colthrup, C. W. 239 (four times)	Prideaux, R. M., F.E.S. .. 266 (twice)
Day, F. H., F.E.S. 62	Prout, L. B., F.E.S., 18, 67, 141, 143, 144, 204
Denso, Paul 311 (note)	Reid, Percy C., F.E.S., 11, 240
Dibley, G. E., F.G.S. 267	Rothschild (Hon), N. C., M.A., F.L.S. 256
Dollman, Hereward C., F.E.S. .. 252	Russell, S. G. Castle, M.I.E.E., F.E.S. 64, 67 (twice)
Donisthorpe, H. St. J. K., F.Z.S., F.E.S., 106, 108, 109 (note), 184 (twice), 185, 208, 215 (twice), 229, 237, 255, 272 (note), 281, 293	Selzer, August 213
Editorial Notes, 17, 18, 20, 41, 53, 65, 72, 91, 144, 254, 272	Sharp, W. E., F.E.S. 88
Edelstein, H. M., F.E.S. 120, 167	Shaw, V. Eric, F.E.S. 68
Edwards, Stanley, F.E.S., F.Z.S., F.L.S. 217	Sheldon, W. G., F.E.S. 185
Elliott, Ernest A., F.E.S. 34	Sich, Alfred, F.E.S., 92 (twice), 104, 186, 212, 248
Ellis, H. Willoughby, F.Z.S., F.E.S. 56	Sloper, G. O., F.E.S. 186
Fenwick, W. P., F.E.S. 306 (twice)	Smallman, Raleigh S., F.E.S. .. 60
Floersheim, Cecil, B.A., F.E.S. 254	St. Quintin, W. H., F.E.S., 91 (twice)
Freer, Richard, M.D. 65	Tetley, A. S., M.A., F.E.S. .. 74
Garman, H. 119	T[utt], J. H. 310
Gillmer, M. 138	Tutt, J. W., F.E.S., 49, 73, 79, 83, 89, 91, 97, 102, 105, 106, 125, 135, 143, 149, 164, 168, 171, 174, 193, 194, 200, 202, 205, 213, 214, 216, 221, 226, 228, 231, 238 (twice), 240, 245, 264, 273, 278, 285, 286, 301
Harrison, J. H. S. 214	Wainwright, Colbran J., F.E.S. 63, 238
Harrison, J. W., B.Sc., F.E.S. 120 (twice), 253	Wheeler G. (Rev.), M.A., F.E.S. 169
Heath, G. H. 237	Whittle, F. G. 63
James, Russell E. 227, 294	Wood, H. 66

LIST OF ILLUSTRATIONS, &c. (Notice to binder.)

	To face	PAGE
PL. I.	Eggs of <i>Cyclopides palaemon</i> and <i>C. sylvius</i>	14
PL. II.	Eggs of <i>Cyclopides palaemon</i> , Micropylar area	31
PL. III.	Eggs of <i>Cyclopides sylvius</i> and <i>Adopaea flava</i> , Micropylar area ..	32
PL. IV.	Front claw of anterior tarsus of British species of <i>Philhydrus</i> ..	25
PL. V.	Melanism in <i>Amphidasys betularia</i>	41
PL. VI.	Genitalia of <i>Marasmarcha tuttodactyla</i>	51
PL. VII.	Genitalia of species of <i>Marasmarcha</i>	52
PL. VIII.	52
PL. IX.	Early stages of <i>Labidostomis tridentata</i> and <i>Prionocyphon</i> <i>serricornis</i>	109
PL. X.	<i>Nemoria viridata</i>	134
PL. XI.	Egg-shell and micropyle of <i>Cleogene peletieraria</i>	153
PL. XII.	Egg-shells and proleg in penultimate stage of full-grown larva of <i>Cleogene peletieraria</i>	153
PL. XIII.	Left half of prothoracic plate of full-grown larva of <i>Cleogene</i> <i>peletieraria</i>	156
PL. XIV.	Larval skins in first and second stages of <i>Cleogene peletieraria</i> ..	154
PL. XV.	Larvæ and pupæ of <i>Cleogene peletieraria</i>	157
PL. XVI.	End of pupa and male genitalia of <i>Cleogene peletieraria</i>	152
PL. XVII.	Ancillary male appendages of <i>Cleogene lutearia</i> and <i>C. nivearia</i> ..	152
PL. XVIII.	Pierre Adrien Prosper Finot	219
PL. XIX.	Eggs of <i>Odezia atrata</i>	224
PL. XX.	<i>Odezia atrata</i> var. <i>pyrenaica</i>	223
PL. XXI.	<i>Nonagria edelsteni</i> , Tutt, and <i>N. neurica</i> , Hb.	287
PL. XXII.	Ancillary appendages of <i>Everes</i> and <i>Binghamia</i>	302

SPECIAL INDEX.

A *Special Index*, containing all references to every species mentioned in this volume will be published with the January number, and should be bound so as to follow the General Index.

The Entomologist's Record and Journal of Variation.

VOL. XIX.

SPECIAL INDEX.

By T. HUDSON BEARE, B.Sc., F.R.S.E., F.E.S. (Coleoptera), M. BURR, B.A., F.Z.S., F.E.S. (Orthoptera), J. COLLIN, F.E.S. (Diptera), H. J. TURNER, F.E.S. (Hemiptera, Hymenoptera, Lepidoptera, etc.).

Coleoptera arranged in order of Genera. The other Orders arranged by Species.

ARANEINA.

	PAGE.
Acari	127, 256
Acarina	6
Antennophorus	6
bostocki, Glyphopsis	6
bostocki, Trachyuropoda	256
coccinea, Glyphopsis	6
comata, Cillibano	256
cuneifer, Lælaps	6, 256
equitans, Lælaps	256
excavata, Trachyuropoda	256
formicariæ, Glyphopsis	6
formicarius, Urotrachytes	256
grandis, Antennophorus	6, 256
laminosa, Trachyuropoda	256
myrmecophylus, Lælaps	6, 256
oophilus, Lælaps	256
ricasoliana, Urodiscelia	6, 256
uhlmanni, Antennophorus	6, 7

COLEOPTERA.

Abdera quadrifasciata	298
Acanthocinus ædilis	307
Acidota crenata	94
Aceritus minutus	114
Acrognathus mandibularis	31
Acrulia inflata	31, 32, 289
Actocharus readingi	258
Acupalpus dorsalis	11
Ægialia sabuleti	229
Aepus marinus	71
robini	71
Agabus affinis	32, 72
unguicularis	11, 32, 72
Agathidium convexum	229
seminulum	113
varians	190, 196
Aleochara cuniculorum	112
discipennis	146
fuscipes	146
lanuginosa	146
morion	293
spadicea	32, 124
succicola	124
tristis	293
villosa	113
Alexia pilifera	25, 114
Amara anthobia	31
aulica	289
communis	289
curta	293
familiaris	31
fulva	94

	PAGE.
livida	289
lucida	31
patricia	112
Amphisternus	148
Anaspis garneysi	26
Anchomenus angusticollis	11
livens	11
oblongus	11
parumpunctatus	11
Anisotoma dubia	293
lucens	31
nigrita	196
punctulata	289
Anitys rubens	297
Anobium paniceum	114, 190, 220
Anommatus 12-striatus	33
Anoplodera 6-guttata	12
Anthrophagus silaceus	292
Anthocomus fasciatus	297
terminatus	259
Anthophagus alpinus	289
Aphodius erraticus	293
fœtens	94
lapponum	94
nitidulus	94
porcus	94
pusillus	257
rufescens	289
zenkeri	257
Apion atomarium	292
confluens	115
curtisi	293
dissimile	293
ebeninum	292
flavimanum	292
hydrolapathi	293
kiesenwetteri	75
lævicolle	293
limonii	292
livescerum	293
loti	293
marchicum	293
ononis	293
pallipes	115
pomonæ	293
pubescens	293
sedi	293
semivittatum	268, 293
tenue	115
urticarium	73, 293
vicinum	292
vorax	292, 293
Arena octavii	94

	PAGE.		PAGE.
<i>Asemum striatum</i>	11, 114, 229, 230	<i>varium</i> 86
<i>Aspidiphorus orbiculatus</i> 114	<i>Berosus affinis</i> 11
<i>Astynomus ædilis</i> 239	<i>Bibloporus bicolor</i> 289
<i>Atemeles emarginatus</i>	94, 254, 238	<i>Bledius opacus</i> 94
<i>paradoxus</i> 254, 258	<i>Bolitobii</i> 94
<i>Athous rhombeus</i> 26, 297	<i>Bolitochara bella</i> 293
<i>undulatus</i> 229	<i>lucida</i> 293
<i>Atomaria basalis</i> 259	<i>lunulata</i> 230
<i>diluta</i> 114	<i>obliqua</i> 190, 289
<i>elongatula</i> 230	<i>Brachytarsus varius</i> 190
<i>gibbula</i> 289	<i>Bradycellus cognatus</i> 289
<i>gutta</i> 259	<i>Bruchus rufipes</i> 297
<i>mesomelas</i> 259	<i>Bryaxis juncorum</i> 11
<i>Aulonium sulcatum</i> 25, 297	<i>Bryoporus rugipennis</i> 289
<i>Autalia puncticollis</i> 229	<i>Bythinus bulbifer</i> 72
<i>rivularis</i> 293	<i>burrelli</i> 72
<i>Badister sodalis</i> 25, 292	<i>curtisi</i> 72
<i>Bagous claudicans</i> 115	<i>puncticollis</i> 72, 94
<i>glabrirostris</i> 137	<i>securiger</i> 72
<i>nigritarsis</i> 137	<i>validus</i> 72, 114
<i>Balaninus pyrrhoceras</i> 115	<i>Cænopsis waltoni</i> 258, 293
<i>Barynotus schonherri</i> 229	<i>Calathus melanocephalus</i>	<i>var.</i>
<i>Barypeithes sulcifrons</i> 258	<i>nubigena</i> 289
<i>Batophila rubi</i> 196	<i>piceus</i> 289
<i>Bembidium</i> 11, 84	<i>Callicerus obscurus</i> 257
<i>æneum</i> 85	<i>Callidium alni</i> 297
<i>affine</i> 86	<i>variabile</i> 26, 297
<i>anglicanum</i> 86	<i>violaceum</i> 11
<i>atrocæruleum</i> 85, 94	<i>Calodera umbrosa</i> 113
<i>biguttatum</i> 85	<i>Calosoma inquisitor</i> 11
<i>bipunctatum</i> 86	<i>sycophanta</i> 31
<i>bruxellense</i> 86, 289	<i>Carabus arvensis</i> 94
<i>clarki</i> 87	<i>glabratus</i> 229, 230, 289
<i>concinnum</i> 86	<i>monilis</i> 260
<i>decorum</i> 86	<i>violaceus</i> 32
<i>doris</i> 85	<i>Cardiophorus erichsoni</i> 30, 31
<i>femoratum</i> 86, 289	<i>rufipes</i> 30
<i>flammulatum</i> 87	<i>Carida affinis</i> 30
<i>gilvipes</i> 87	<i>Carpophilus sexpustulatus</i> 31
<i>guttula</i> 85	<i>Cartodere filiformis</i> 114
<i>lampros</i> 85	<i>ruficollis</i> 114
<i>var. velox</i> 85	<i>Cassida equestris</i> 12
<i>littorale</i> 86	<i>flaveola</i> 293
<i>lunatum</i> 86	<i>nobilis</i> 258
<i>mannerheimi</i> 85	<i>Caulotrypis æneopiceus</i> 73, 292
<i>minimum</i> 85, 196	<i>Cerylon fagi</i> 11, 293
<i>monticola</i> 86, 258	<i>ferrugineum</i> 11
<i>nigricorne</i> 85, 112	<i>histeroides</i> 11
<i>nitidulum</i> 87	<i>Cetonia aurata</i> 11, 133, 292
<i>normannum</i> 85	<i>Ceuthorhynchidius nigrinus</i> 115
<i>obliquum</i> 87	<i>posthumus</i> 115
<i>obtusum</i> 85	<i>quercicola</i> 292
<i>pallidipenne</i> 86	<i>rufulus</i> 292, 293
<i>paludosum</i> 87	<i>terminatus</i> 292
<i>prasinum</i> 86	<i>Ceuthorhynchus viduatus</i> 308
<i>punctulatum</i> 86	<i>Chætocnema aridula</i> 12
<i>quadriguttatum</i> 86	<i>confusa</i> 12
<i>quinquestriatum</i> 25, 85	<i>hortensis</i> 12
<i>riparium</i> 87	<i>Chilocorus bipustulatus</i> 114, 297
<i>rufescens</i> 85	<i>similis</i> 114
<i>saxatile</i> 86	<i>Choleva augustata</i> 289
<i>schuppeli</i> 85	<i>colonoides</i> 26, 32
<i>stomoides</i> 86	<i>coracina</i> 289
<i>testaceum</i> 86	<i>grandicollis</i> 11
<i>tibiale</i> 85, 94, 257	<i>intermedia</i> 114, 289

	PAGE.
<i>kirbyi</i>	94
<i>longula</i>	289
<i>Chrysomela banksi</i>	258
<i>didymata</i>	12
<i>distinguenda</i>	292
<i>hæmoptera</i>	293
<i>varians</i>	115
<i>Cicones variegata</i>	26
<i>Cillenus lateralis</i>	71
<i>Cis alni</i>	136
<i>bidentatus</i>	136, 289
<i>boleti</i>	289
<i>dentatus</i>	136, 308
<i>fuscatus</i>	25
<i>hispidus</i>	25, 114, 289
<i>jacquemarti</i>	289
<i>lineatocribratus</i>	114, 289
<i>micans</i>	114
<i>nitidus</i>	289
<i>punctulatus</i>	229, 289
<i>pygmæus</i>	25
<i>vestitus</i>	25
<i>Cleonus sulcirostris</i>	293
<i>Clerus formicarius</i>	229, 230
<i>Clinocara undulata</i>	115
<i>Clivina fossor</i>	289
<i>Coccidula scutellata</i>	25, 259
<i>Coccinella 5-punctata</i>	196, 229
<i>Codiosoma spadix</i>	292
<i>Celiodes cardui</i>	292
<i>Collyris apicalis</i>	148
<i>Colon dentipes</i>	114
<i>Conopalpus testaceus var. vigorsi</i>	298
<i>Conosoma immaculatum</i>	258
<i>Corticaria crenicollis</i>	29
<i>fenestralis</i>	230
<i>pubescens</i>	259
<i>serrata</i>	30, 190
<i>Corylophus sublævipennis</i>	258
<i>Corymbites æneus</i>	258
<i>impressus</i>	229
<i>metallicus</i>	11
<i>tessellatus</i>	11
<i>Criocephalus rusticus</i>	230
<i>Crypticus quisquilius</i>	293
<i>Cryptocephalus aureolus</i>	196
<i>bipunctatus</i>	308
<i>coryli</i>	190
<i>fulvus</i>	292
<i>Cryptohypnus dermestoides</i>	229
<i>var. 4-guttatus</i>	229
<i>pulchellus</i>	31, 229
<i>riparius</i>	229
<i>Cryptomorpha desjardinsi</i>	30
<i>Cryptophagus lycoperdi</i>	114
<i>parallelus</i>	229
<i>subdepressus</i>	268, 288
<i>Cteniopus sulphureus</i>	293
<i>var. bicolor</i>	293
<i>Curculio abietis</i>	12
<i>Cychnus rostratus</i>	32, 229, 289
<i>Cyclonotum orbiculare</i>	11
<i>Cymindis vaporarium</i>	229, 289
<i>Cyphon padi</i>	11
<i>Dacne</i>	32

	PAGE.
<i>fowleri</i>	32
<i>humeralis</i>	293
<i>Dendrophagus</i>	229
<i>Dendrophilus punctatus</i>	255
<i>Deporaus megacephalus</i>	190
<i>Deronectes depressus</i>	11
<i>Dinarda dentata</i>	29
<i>mærkeli</i>	113
<i>pygmæa</i>	29, 258
<i>Diphyllus lunatus</i>	257
<i>Ditoma crenata</i>	26
<i>Donacia affinis</i>	114
<i>clavipes</i>	267
<i>crassipes</i>	267
<i>discolor</i>	12
<i>impressa</i>	259
<i>obscura</i>	30, 114, 259
<i>sericea</i>	12
<i>thalassina</i>	12
<i>vulgaris</i>	12
<i>Dorcus parallelopipedus</i>	258
<i>Drilus flavescens</i>	32
<i>Dromius agilis var. bimaculatus</i>	30
<i>Dryocætes villosus</i>	297
<i>Dryophilus pusillus</i>	114
<i>Dyschirius politus</i>	112
<i>Dytiscus punctulatus</i>	11, 33
<i>Elater coccinatus</i>	297
<i>lythropterus</i>	11, 190, 297
<i>nigrinus</i>	229, 230
<i>sanguinolentus</i>	11
<i>Elmis parallelopipedus</i>	258
<i>Encephalus complicans</i>	258
<i>Endomychus coccineus</i>	26
<i>Enicmus fungicola</i>	146
<i>rugosus</i>	114, 190
<i>testaceus</i>	114
<i>Epipeda plana</i>	113
<i>Episomus</i>	148
<i>Epuræa angustula</i>	32, 297
<i>oblonga</i>	289
<i>parvula</i>	11
<i>Erirhinus æthiops</i>	115
<i>Ernobius mollis</i>	25
<i>nigrinus</i>	229
<i>Eros aurora</i>	229
<i>Eryx ater</i>	25, 26, 298
<i>Eubrychius velatus</i>	115, 259
<i>Eumicrus rufus</i>	30, 297
<i>Euplectus ambiguus</i>	114
<i>minutissimus</i>	31, 114
<i>piceus</i>	114
<i>sanguineus</i>	114
<i>tomlini</i>	29
<i>Euryporus picipes</i>	289
<i>Euthia schaumii</i>	293
<i>Exomias pyrenæus</i>	133
<i>Falagria sulcatula</i>	113
<i>Florilinus musæorum</i>	114
<i>Galerucella lineola</i>	259
<i>sagittariæ</i>	259
<i>Galerucine</i>	33
<i>Geodromicus globulicollis</i>	289
<i>Geotrupes mutator</i>	133
<i>typhæus</i>	114, 133

	PAGE.		PAGE.
<i>Gnathoncus nannetensis</i> ..	133, 134	<i>pallens</i>	113, 114
<i>nidicola</i> ..	133, 134, 135, 136	<i>paradoxa</i>	29, 124
<i>punctulatus</i> ..	25, 133, 134	<i>parallella</i>	113
<i>rotundatus</i> ..	133, 134, 135, 136	<i>pavens</i>	94, 257
<i>Gracilia minuta</i> ..	26, 72	<i>subtilissima</i>	113, 114
<i>Grammoptera holomelina</i> ..	26	<i>succicola</i>	196
<i>præusta</i>	12	<i>xanthopus</i>	289
<i>Gymnetron antirrhinæ</i> ..	292	<i>Hopliinæ</i>	33
<i>Gyrophæna gentilis</i> ..	94	<i>Hydnobius punctatissimus</i> ..	113
<i>minima</i>	94	<i>Hydræna britteni</i>	99
<i>nana</i>	94	<i>nigrita</i>	99
<i>Hæmonia curtisi</i> ..	267	<i>riparia</i>	11, 99, 257
<i>Halacritus punctum</i> ..	94	<i>Hydrobius fuscipes var. æneus</i> ..	112
<i>Haliplus flavicollis</i> ..	11	<i>Hydrochus nitidicollis</i> ..	29
<i>fulvus</i>	257	<i>Hydroporus erythrocephalus</i> ..	77
<i>mucronatus</i>	257	<i>ferrugineus</i>	112
<i>variegatus</i>	257	<i>incognitus</i>	77, 78, 112
<i>Halticinæ</i>	33	<i>lepidus</i>	289
<i>Halyzia 16-guttata</i> ..	114	<i>lituratus</i>	257
<i>Hapalaræa pygmæa</i> ..	113	<i>morio</i>	289
<i>Haplocnemus impressus</i> ..	297	<i>obsoletus</i>	112
<i>Harpalus attenuatus</i> ..	196	<i>palustris</i>	77, 78
<i>azureus var. similis</i> ..	292	<i>Hydrothassa marginella</i> ..	12
<i>caspicus</i>	73	<i>Hydrovatus clypealis</i> ..	148, 257
<i>latus</i>	289	<i>Hygronoma dimidiata</i> ..	113
<i>4-punctatus</i>	229	<i>Hylesinus crenatus</i> ..	26, 298
<i>Hedobia imperialis</i> ..	25, 114, 297	<i>fraxini</i>	26
<i>Heledona agaricola</i> ..	26	<i>vittatus</i>	26, 136
<i>Helodes marginata</i> ..	11	<i>Hylotropes bajulus</i> ..	297
<i>Helophorus brevicollis</i> ..	196	<i>Hypera fasciculata</i> ..	293
<i>nanus</i>	196	<i>plantaginis</i>	12, 258
<i>rugosus</i>	289	<i>polygoni</i>	12, 94, 292
<i>Helops pallidus</i> ..	293	<i>rumicis</i>	12
<i>Henoticus serratus</i> ..	31	<i>tigrina</i>	268, 292
<i>Heptaulacus sus</i> ..	293	<i>variabilis</i>	12, 257
<i>Heterothops binotata</i> ..	94	<i>Hypocyptus discoideus</i> ..	259
<i>nigra</i>	32, 124	<i>Hypophleus castaneus</i> ..	190
<i>prævia</i>	113	<i>Ilybius fenestratus</i> ..	11
<i>Hister bissexstriatus</i> ..	114	<i>Ips quadriguttatus</i> ..	257
<i>merdarius</i>	25	<i>4-pustulatus</i>	11, 229, 230
<i>marginatus</i>	289	<i>Ischnoglossa prolixa</i> ..	257
<i>12-striatus</i>	30, 114	<i>Ischnomera cærulea</i> ..	12
<i>14-striatus</i>	30	<i>Ischnopoda cærulea</i> 113, 257, 258, 289	
<i>Homalium cæsum var. subruficorne</i> 30		<i>Laccobius alutaceus</i> ..	257
<i>var. tricolor</i>	113	<i>oblongus</i>	75
<i>gracilicorne</i>	113	<i>sinuatus</i>	28, 257
<i>septentrionis</i>	113	<i>Læmophleus bimaculatus</i> ..	25, 297
<i>vile var. heeri</i>	289	<i>duplicatus</i>	11
<i>Homalota alpestris</i> ..	289	<i>Lamprinus saginatus</i> ..	31
<i>angustula</i>	113	<i>Lathrobium elongatum var. nigrum</i> 30	
<i>autumnalis</i>	113	<i>lævipenne</i>	29
<i>cadaverinus</i>	289	<i>rufipenne</i>	308
<i>cambrica</i>	94	<i>terminatum var. immaculatum</i> 113	
<i>cavifrons</i>	113	<i>Lebia chlorocephala</i> ..	94
<i>coriaria</i>	113	<i>crux-minor</i>	274
<i>currax</i>	94, 257	<i>Leptidea brevipennis</i> ..	26, 72, 297
<i>cuspidata</i>	113	<i>Leptura scutellata</i> ..	26, 297
<i>eremita</i>	94	<i>Leptusa analis</i>	289
<i>hepatica</i>	113	<i>Lesteva sharpi</i>	289
<i>insecta</i>	94	<i>Licinus depressus</i>	293
<i>linearis</i>	94	<i>Limnebius papposus</i> ..	11
<i>longula</i>	113, 358	<i>truncatellus</i>	11
<i>mortuorum</i>	113	<i>Limnobaris t-album</i> ..	259
<i>orbata</i>	94	<i>Limobius mixtus</i>	293
<i>pagana</i>	289	<i>Liodes castanea</i>	32, 289

	PAGE.		PAGE.
<i>glabra</i>	229, 289	<i>Myrmedonia cognata</i>	255
<i>humeralis</i>	94	<i>limbata</i>	255
<i>Litodactylus leucogaster</i>	115	<i>Nacerdes melanura</i>	191, 298
<i>Lixus algiurus</i>	196	<i>Necrophorus mortuorum</i>	11
<i>paraplecticus</i>	196	<i>Neuraphes angulatus</i>	114
<i>Lomechusa strumosa</i>	29, 127, 254	<i>elongatulus</i>	289
<i>Longitarsus holsaticus</i>	12	<i>rubicundus</i>	114
<i>lycopi</i>	196	<i>sparshalli</i>	114
<i>ochroleucus</i>	12	<i>var. minutus</i>	114
<i>suturellus</i>	289	<i>Niconia</i>	148
<i>Loricera pilicornis</i>	11	<i>Nitidula bipustulata</i>	25
<i>Lucanus cervus</i>	133	<i>rufipes</i>	25
<i>Luperus flavipes</i>	12	<i>Notiophilus quadriguttatus</i>	112
<i>rufipes</i>	12	<i>rufipes</i>	25, 297
<i>Lycus brunneus</i>	25, 297	<i>Notothecta anceps</i>	113
<i>canaliculatus</i>	25	<i>flavipes</i>	113
<i>Lytta vesicatoria</i>	52	<i>Nudobius lentus</i>	229, 230
<i>Magdalinus carbonarius</i>	190	<i>Ocalea badia</i>	230
<i>Magdalis armigera</i>	303	<i>castanea</i>	257
<i>carbonaria</i>	190, 303	<i>Ochthebius nanus</i>	257
<i>duplicata</i>	230, 268	<i>pygmaeus</i>	11, 257
<i>phlegmatica</i>	229, 230, 303	<i>Ocypus ater</i>	292
<i>pruni</i>	115, 303	<i>brunnipes</i>	257
<i>Malthinus frontalis</i>	190, 289	<i>compressus</i>	292
<i>Malthodes mysticus</i>	230, 289	<i>pedator</i>	292
<i>pellucidus</i>	114, 229	<i>similis</i>	259
<i>Mantura rustica</i>	293	<i>Edemera lurida</i>	115
<i>var. suturalis</i>	293	<i>Olibrus æneus</i>	114
<i>Masoreus wetterhali</i>	293	<i>flavicornis</i>	292
<i>Medon castaneus</i>	124	<i>liquidus</i>	196, 293
<i>obsoletus</i>	113	<i>Oligota apicata</i>	190
<i>piceus</i>	257	<i>atomaria</i>	113
<i>pocofer</i>	258	<i>punctulata</i>	293
<i>propinqua</i>	124	<i>Olophrum fuscum</i>	113
<i>Megacronus cingulatus</i>	11	<i>Omosita depressa</i>	11
<i>inclinans</i>	26, 289	<i>Opilo mollis</i>	26
<i>Megarhtrus depressus</i>	94	<i>Orchesia micans</i>	298
<i>sinuatocollis</i>	94	<i>Orchestes avellanæ</i>	12, 289
<i>Melanotus rufipes</i>	11	<i>ilicis</i>	12
<i>punctolineatus</i>	293	<i>quercus</i>	12
<i>Meligethes viduatus</i>	114	<i>rusci</i>	12, 289
<i>Meloe proscarabæus var. cyaneus</i>	115	<i>salicis</i>	12
<i>Melolontha vulgaris</i>	11	<i>Orectochilus villosus</i>	289
<i>Mezium affine</i>	25	<i>Orthochaetes setiger</i>	115, 293
<i>Micralymma brevipenne</i>	71	<i>Orthoperus atomarius</i>	190
<i>Microglossa gentilis</i>	32	<i>atomus</i>	114
<i>marginalis</i>	32	<i>brunnipes</i>	25, 297
<i>suturalis</i>	113	<i>mundus</i>	297
<i>Micropeplus margaritæ</i>	190	<i>Othius læviusculus</i>	257, 292
<i>Miscodera arctica</i>	112, 229	<i>melanocephalus</i>	94
<i>Molorchus minor</i>	297	<i>myrmecophilus</i>	94, 230, 255
<i>Monotoma conicicollis</i>	114	<i>Otioryhncus auropunctatus</i>	133
<i>Mordellistena abdominalis</i>	298	<i>blandus</i>	229
<i>humeralis</i>	12	<i>ligneus</i>	94
<i>pumila</i>	259	<i>maurus</i>	230, 289
<i>Morychus æneus</i>	229	<i>morio var. ebeninus</i>	31
<i>Mycetochares bipustulata</i>	298	<i>ovatus</i>	94
<i>Mycetophagus atomarius</i>	114	<i>septentrionis</i>	229
<i>Mycetoporus angularis</i>	11	<i>Oxylæmus variolosus</i>	124
<i>clavicornis</i>	196	<i>Oxyomus porcatus</i>	292
<i>splendens</i>	11	<i>Oxypoda annularis</i>	289
<i>splendidus</i>	11	<i>brachyptera</i>	94
<i>Myelophilus piniperda</i>	113	<i>hamorrhœa</i>	289
<i>Myllæna minuta</i>	259, 289	<i>metatarsalis</i>	75, 124
<i>Myrmecopora sulcata</i>	94	<i>pallidula</i>	230

	PAGE.		PAGE.
soror	31	Procas armillatus	31
spectabilis.. ..	124, 257	Prognatha quadricornis	257
tarda	113	Proteinus brachypterus	257
vittata	113	Pselaphus dresdensis	114
Oxytelus fairmairii.. ..	124	Pseudostyphlus pilumnus	298
inustus	196, 293	Psylliodes chrysocephala	292
sculpturatus	124	dulcamaræ	259
Pachylopus maritimus	114	marcida	94
Pæderus caligatus	11	Ptenidium gressneri	190, 255
fuscipes	11	wankowiezi	229
littoralis	11	Pterostichus æthiops	94
Panageus quadripustulatus	258	diligens	289
Paracymus æneus	254, 308	lepidus	112
nigro-æneus	254, 308	madidus	11
Paramecosoma melanocephalum	258	niger	11
Paromalus flavicornis	25	oblongo-punctatus	94
Pediacus dermestoides	297	striola	11
Pelophila borealis	132	versicolor	274
Pentarthrum huttoni	258	vitreus	229
Perileptus areolatus	94	vulgaris	11
Phædon cochleariæ	12	Ptilium myrmecophilum	255
tumidulus	12	Ptinella aptera	114
Phalacrus corruscus	292	Ptinus fur	230
brisouti	293	pusillus	25, 30
Philonthus albipes	196, 289	subpilosus	114, 190
cephalotes	196	Pytho	229
ebeninus var. corruscus.. ..	11	Quedius auricomus	94, 257
fuscus	26, 32	boops	94
lepidus	293	brevicornis	25, 32
longicornis	257, 293	fulgidus	25
puella	94	fuliginosus	94
splendens	11	fulvicollis	289
splendidulus	190	fumatus	289
umbratilis	289	lateralis	26
vernalis	94	longicornis	30, 113, 124
Philorinum sordidum	94	maurorufus	289
Phlæobium clypeatum	292	microps	26
Phlæophilus edwardsi	114	nigricans	94
Phlæopora reptans	257	obliteratus	113
Phlæotrya rufipes	26, 191, 298	picipes	94
stephensi	191	riparius	31, 148, 257
Phyllobius calcaratus	12	scitulus	26, 113
Phyllobrotica 4-maculata	12	umbrinus	257
Phyllotreta exclamationis	12	ventralis	25, 26, 136, 297
nigripes	12	vexans	29, 113, 124, 289
tetrastigma	12	zanthopus.. ..	190, 229, 257, 289
Phytobius muricatus	115	Rhagium indagator	230
4-tuberculatus	94	Rhagonycha elongata	230
Phytodecta viminalis	12	testacea	11
Phytosus balticus	94	Rhantus pulverosus	11
spinifer	94	Rhinocyllus laterostris	73
Pissodes notatus	230	Rhinomacer attelaboides	229
pini	230	Rhinoncus gramineus	259
Pityogenes bidentatus	230	perpendicularis	259
Pityophthorus pubescens	230	Rhizophagus bipustulatus.. ..	11
Placusa complanata	113	dispar	257
Platambus maculatus	11	ferrugineus	11
var. immaculatus	112	nitidulus	289
Platyderus ruficollis	297	Rhopalodontus fronticornis	297
Polydrusus confluens	12	Rhopalomesites tardyi	132, 258
flavipes	12	Rhynchites æneovirens	12
Poophagus nasturtii	115	æquatus	12
Præocuris junci	257	interpunctatus	190
Pria dulcamaræ	11	nanus	289
Prionus coriarius	26, 297	Rybaxis sanguinea	259

	PAGE.
<i>Salpingus æratus</i>	115
<i>foveolatus</i>	115
<i>Saperda scalaris</i>	190, 229
<i>Saprinus immundus</i>	293
<i>maritimus</i>	293
<i>nitidulus</i>	293
<i>Scaphidema metallicum</i>	26
<i>Scaphidium 4-maculatum</i>	11, 94
<i>Scolytus pruni</i>	26
<i>rugulosus</i>	26
<i>Scopæus rubidus</i>	258
<i>Scraptia fuscula</i>	298
<i>Scydæmus exilis</i>	190, 229
<i>Scymnus hæmorrhoidalis</i>	114
<i>minimus</i>	25
<i>pygmæus</i>	25
<i>Sericosomus brunneus</i>	11
<i>fugax</i>	229
<i>Sinodendron cylindricum</i>	26
<i>Silpha lævigata</i>	11
<i>nigrita</i>	230
<i>Silvanus surinamensis</i>	25
<i>unidentatus</i>	11
<i>Sipalia ruficollis</i>	94
<i>Sitaris muralis</i>	31, 268
<i>Sitones cambricus</i>	12
<i>crinitus</i>	293
<i>griseus</i>	257, 293
<i>Soronia punctatissima</i>	196
<i>Sphindus dubius</i>	297
<i>Sphodrus leucophthalmus</i>	73
<i>Staphylinidæ</i>	11
<i>Staphylinus cæsaureus</i>	11
<i>latebricola</i>	11
<i>stercorarius</i>	94, 230, 255, 292
<i>Steatoderus ferrugineus</i>	265
<i>Stenus ærosus</i>	113
<i>annulatus</i>	113
<i>argus</i>	113
<i>foveicollis</i>	289
<i>geniculatus</i>	289
<i>guynemeri</i>	257
<i>incanus</i>	94
<i>niveus</i>	113, 257
<i>ossium var. insularis</i>	30
<i>Stilbus oblongus</i>	259
<i>Strophosomus faber</i>	293
<i>Styrax tricondyloides</i>	148
<i>Sunius filiformis</i>	258
<i>Symbiotes latus</i>	25, 297
<i>Synchita juglandis</i>	190
<i>Syntomium æneum</i>	94
<i>Tachinus elongatus</i>	230
<i>Tachyporus humerosus</i>	289
<i>Taphria nivale</i>	230
<i>Telmatophilus caricis</i>	25, 114
<i>schönherri</i>	260
<i>sparganii</i>	259
<i>Tetropium castaneum</i>	26
<i>crawshayi</i>	26
<i>fuscum</i>	26
<i>gabrielli</i>	26, 259, 297
<i>Thamiaræa cinnamomea</i>	196
<i>Thanasimus formicarius</i>	11, 196
<i>Thinobius linearis</i>	114

	PAGE.
<i>Thryogenes festucae</i>	259
<i>Thyamis holsatica</i>	259
<i>Thymalus limbatus</i>	11
<i>Tillus elongatus</i>	11
<i>Tiresias serra</i>	114
<i>Trachyphloeus alternans</i>	293
<i>aristatus</i>	115
<i>scabriculus</i>	293
<i>Trachys troglodytes</i>	11
<i>Trechus discus</i>	112
<i>micros</i>	94
<i>Triarthron mærkeli</i>	113
<i>Trichius fasciatus</i>	229
<i>Trichopteryx</i>	229
<i>bovina</i>	114
<i>Triplax lacordairei</i>	196
<i>rossica</i>	26
<i>Trogolinus anglicanus</i>	258
<i>Trogophloeus arcuatus</i>	258
<i>rivularis</i>	113, 196
<i>Tropiphorus obtusus</i>	229
<i>Trypodendron domesticum</i>	26, 257
<i>lineatum</i>	115, 229
<i>quercus</i>	148, 257
<i>Tychius pygmæus</i>	293
<i>tibialis</i>	293
<i>Tychus niger</i>	114
<i>Xantholinus tricolor</i>	196, 230
<i>glaber</i>	25
<i>Xyleborus saxesini</i>	26
<i>Xylophilus oculatus</i>	298
<i>Zabrus gibbus</i>	292
<i>Zelota</i>	148

COLLEMBOLA.

<i>Anurida</i>	71
<i>maritima, Anurida</i>	71
<i>muscorum, Anura</i>	71

CRUSTACEA.

<i>Crustacea</i>	7
<i>hoffmanseggii, Platyarthrus</i>	7
<i>opacum, Armadillium</i>	7
<i>ratzeburgi, Porcellio</i>	7
<i>scaber, Porcellio</i>	7

DIPTERA.

<i>aterrima, Trineura</i>	4
<i>avicularia, Ornithomyia</i>	75
<i>bombylans, Volucella</i>	82
<i>curtiventris, Limosina</i>	4
<i>Diptera</i>	4, 255
<i>inaequalis, Phora</i>	4
<i>infumata, Scatopse</i>	4
<i>lagopodis, Ornithomyia</i>	75
<i>Microdon</i>	148
<i>Musca</i>	194
<i>mutabilis, Microdon</i>	255
<i>myrmecophilus, Ceratopogon</i>	4
<i>Phyllomyza</i>	4, 255
<i>pulicaria, Phora</i>	4
<i>Scatopse</i>	255

	PAGE.
Sciara	4
seuricornis, Phyllomyza	4
transversalis, Scatopse	4
Volucella	265

HEMIPTERA.

æneus, Esycorus	220
Aphidæ	6, 183
Aphis	6
baërensprungi, Ploiariodes	242
bonnairei, Æpophilus	71
brevipennis, Xylocoridae	242
brevipes, Megalocera (Trygonotylus)	242
brevis, Nabis	242
Coccidæ	5, 127, 148, 255
donisthorpii, Ripersia	5, 7
equestris, Lygæus	268
evanescens, Plagiognathus (Agallia)	242
ferrugatus, Elasmostethus	242
flavicornis, Cydnus	242
formicaria, Forda	6
formicarii, Ripersia	5, 7
formicetorum, Piezostethus	230, 255, 268
gothicus, Lopus	220
gracilis, Myrmecoris	242
Hemiptera	4
hyalinus, Corizus	242
maculatus, Coriscus	220
morio, Salda	242
pilicornis, Drymus	242
plantaginis, Aphis	6
rhomboidea, Verlusia	196
saundersi, Corixa	242
scurra, Idiocerus	267
selecta, Corixa	242
setariae, Tetranium (Tychæa)	6
setulosa, Salda	242
tomlini, Ripersia	5
troglydites, Trama	6
vulnerata, Triephora	239
vulneratus, Poecilosecytus	242
waltlii, Pseudophlæas	242

HYMENOPTERA.

afra, Cælioxys	51
Alapta	128
Anagri	128
Antæon	80
apterus, Chasmodon	255
Aptes	185
argentata, Megachile	51
Bethylidæ	79
Bethylinidæ	184
Bethylinæ	184
bicolor, Gonatopus	8, 79, 80, 81, 82
billupsi, Thaumatotypus	183
Braconidæ	4, 183, 184, 255
brevis, Cælioxys	51
brevicornis, Halticus = Halictus	51
brevitarsis, Xestophanes	260
cæspitum, Tetramorium	6, 8, 256

	PAGE.
calycis, Cynips	265
Camponotus	6
Chalcidæ	184
Chalcididæ	5
Chrysopa	265
claripennis, Goniozus	82
contracta, Ponea	5, 82
Cryptinæ	182, 183, 184, 185
Cynipidæ	183, 184, 255
distinctus, Gonatopus	8, 79, 81, 82
distingendus, Gonatopus	8, 80, 81, 82
Dryininæ	79, 80, 184
Dryinus = Gonatopus	82
Embolemininæ	184
Entomophaga	184
Exallonyx	184
exsecta, Formica	256
flava, Formica	109
flavus, Lasius	5, 6, 7, 256
Flexiliventre	183
Formicidæ	254
formiciformis, Cephalonomia	260
friesei, Diodonotus	51
fuliginosus, Lasius	4, 5, 6, 7, 255, 256
fusca, Formica	6, 8, 148, 254, 255, 256, 260
fuscocorufarbis (rufifarbis var.), Formica	5, 6, 254, 256
gigas, Sirex	220, 265
Gonatopus	8, 79, 80, 82
Ichneumon	184
Ichneumonidæ	182, 183, 184, 185
Ichneumonidea	182, 183
Ichneumonides	184
Ichneumoninæ	182, 184, 185
Joppides	184
juvencus, Sirex	265
ljunghii, Gonatopus	80, 81, 82
lunatus = marshalli, Gonatopus	8
manicatum, Anthidium	268
marshalli, Gonatopus	8, 81
Microcryptus	185
minimus, Alaptus	128
Mymaridæ	128, 184
myrmecophila, Kleditoma	255
Myrmica	6
Myrica	82
niger, Lasius	5, 6, 7, 254, 255
nigra, Epyris	82
nigrivertris, Gonatopus	82
oratorius, Gonatopus	79, 80, 81
Parasitica	186
pedestris, Dicondylus	80, 82
pedestris = bicolor, Gonatopus	8, 79, 80
pedestris = distinctus, Gonatopus	8, 79, 80
pedestris = distinguendus, Gonatopus	8, 80
Pezomachus	182
pilosus, Gonatopus	8, 81, 82
Pimplinæ	186
potentillæ, Xestophanes	260
Proctotrypes	184
Proctotrypidae	183, 184

	PAGE.
punctatissima = contracta, Ponea	82
rubra, Myrmica	6
rufa, Formica, 4, 7, 127, 230,	255, 256
rufibarbis, Formica ..	5, 6, 254, 256
rugulosa, Myrmica ..	6
sanguinea, Formica 6, 7, 127, 280,	254, 255, 256, 268
scabrinodes, Mymica ..	230, 255
sepsoides (sociabilis), Gonatopus	7, 8, 80, 81
Sirex	265
sociabilis = sepsoides, Gonatopus	7, 8, 80, 81
Spalangia	5
striatus, Gonatopus ..	8, 81
subpilosus, Gonatopus ..	8, 80, 81
substriatus, Gonatopus ..	8, 80, 81
Tenthredo	264
umbratus, Lasius	256
unifasciatus, Lepothorax ..	254

LEPIDOPTERA.

abbreviata, Eupithecia	64
abietaria, Boarmia	52, 100
abjecta, Mamestra	291
abmarginata var. (politata), Ptychopoda	161
abruptaria, Hemerophila (Synopsia) 52, 63, 144, 188, 220,	306
absynthiata, Eupithecia ..	24, 64
acaciæ, Nordmannia (Thecla) 104,	150, 197, 202, 213, 246, 284
aceris, Acronycta	163
aceris, Neptis	246, 282, 283
achilleæ, Anthrocera	175, 202
achine, Pararge	45, 89, 105
Acidalia = Ptychopoda	161
acis, see semiargus, Cyaniris (Lycæna)	
Acronycta	91
actæa, Satyrus 155, 156, 158, 223	
acteon, Thymelicus 150, 158,	174, 197, 202, 208, 263, 302
adactyla, Agdistis	53, 58
addenda ab. (semele), Hipparchia	132
adippe, Argynnis 44, 92, 104,	105, 107, 131, 151, 155, 158,
	164, 208, 219, 284
adonis see bellargus, Polyommatus	
adrasta var. (mæra), Pararge ..	100
adusta, Hadena	213
adustata, Ligdia	63
advenaria, Epione	63
ægeria, see egeria, Pararge	
Ægeriidae	83
ægon, see argus, Plebeius	
ællo, Oeneis	43, 44, 92
ænea, Phytometra	174
æscularia, Anisopteryx ..	63, 74, 212
æstiva var. (boeticus), Lampides	67, 211
æstivaria var. (thymiaria), Hemi-	234, 235, 236, 243, 247,
	248, 278, 280

	PAGE.
æthiops (blandina), Erebia 100,	130, 132, 150, 226, 228, 233, 272
æthiops var. (strigilis), Miana ..	91
affinis, Cosmia (Calymnia) ..	76, 91
agathina, Agrotis	51
agathina, Mylothris	307
Agdistis	53
agestis, see astrarche, Aricia	
aglaia, Argynnis 89, 124, 197,	198, 201, 202, 208, 224, 233,
	271, 302
Agrotis	218
ahenella, Hypochalcia	206
albicillata, Melanthia	64, 207
albicosta, Coleophora	244
albipuncta, Leucania	229
albistrigalis, Hypenodes	208
albomarginata ab. (grossulariata),	
Abraxas	83, 295
alboprivata ab. (delius), Parnassius	44
alboundulata ab. (æstivaria), Hemi-	
thea	235, 236
alcææ, Erynnis	88, 151, 155, 158
alchemillata, Emmelesia	224
alciphron, Loweia (Chrysophanus)	156, 158, 174, 197, 202,
	246, 284
alcon, Lycæna	43, 44
alcyone, Satyrus 150, 151, 154, 158,	226
alcyonipennella, Coleophora ..	212
alecto, Erebia	43, 199, 201, 233
alexanor, Papilio	158, 175, 203
alexis, see icarus, Polyommatus	
allardii, Plebeius	211
alniaria, Ennomos	306
alpina var. (astrarche), Aricia 52,	307
alpina var. (aurelia), Melitæa ..	225
alpina var. (dictynna), Melitæa ..	225
alpina var. (didyma), Melitæa ..	131
alpinalis, Scopula	269
alpinata, Psodos	100
alpinellus, Crambus	174
alsines, Caradrina	231
alsus, see minima, Cupido	
alternana, Conchylis	75
althææ, Erynnis	228, 245, 284
alveolus, see malvæ, Hesperia (Syrichtus)	
alveus, Hesperia (Syrichtus) 130,	131, 150, 158, 174, 197, 198,
	201, 202, 223, 226, 228, 270, 271
amanda, Polyommatus	68
amaryllis, Heliconius	76
amathusia, Brenthis 197, 202,	232, 233, 271, 302
ambigua, Caradrina	205, 229
ambigualis, Scoparia	231
amphidamas, Loweia (Chryso-	
phanus)	55
anceps, Mamestra	147, 205, 231
andrenæforme (is), Trochilium	(Ægeria) 48, 101, 102, 103,
	144, 203, 213, 262, 268
angularia, Ennomos	63
angustalis, Cledeobia	207

	PAGE.
<i>anomala</i> , <i>Stilbia</i>	290
<i>antiochena var.</i> (<i>semirargus</i>), <i>Cyaniris</i> (<i>Nomiades</i>)	68
<i>antiopa</i> , <i>Eu Vanessa</i> 89, 105, 106, 107, 111, 150, 163, 164, 192, 197, 202, 272, 275, 276, 277	
<i>antiqua</i> , <i>Notolophus</i>	230
<i>Apatura</i>	246
<i>apicola</i> , <i>Malacosoma</i>	99
<i>apiformis</i> , <i>Trochilium</i>	48
<i>apollo</i> , <i>Parnassius</i> 104, 131, 149, 152, 175, 198, 226, 302	
<i>Aporia</i>	260
<i>aprilina</i> , <i>Agriopis</i>	25, 73
<i>aquitana</i> <i>var.</i> (<i>infirmaria</i>), <i>Ptychopoda</i>	162
<i>arbuti</i> , <i>Heliodos</i>	62
<i>arcania</i> , <i>Cænonympha</i> 45, 92, 105, 158, 198, 245, 269, 271, 284	
<i>arcas</i> , <i>Lycæna</i>	42, 130, 131
<i>Arctides</i>	90
<i>arcuosa</i> , <i>Chortodes</i>	62, 206, 224
<i>areola</i> , <i>Xylocampa</i>	212
<i>arete ab.</i> (<i>hyperanthus</i>), <i>Enodia</i> (<i>Aphantopus</i>)	44, 45
<i>arethusa</i> , <i>Hipparchia</i> 151, 155, 157, 159, 222, 226	
<i>argentula</i> , <i>Banksia</i>	244
<i>argentula</i> , <i>Coleophora</i>	8
<i>argiades</i> , <i>Everes</i>	88, 164, 222
<i>argillacea var.</i> (<i>favicolor</i>), <i>Leucania</i>	76
<i>argiolus</i> , <i>Celastrina</i> 41, 89, 105, 121, 143, 144, 147, 158, 166, 213, 223, 228, 243, 267, 284	
<i>argus</i> (<i>ægon</i>), <i>Plebeius</i> 51, 88, 147, 151, 158, 164, 166, 198, 199, 201, 222, 228, 244, 245, 267, 272, 302	
<i>Argynnis</i>	282
<i>argyrognomon</i> , <i>Plebeius</i> 44, 88, 104, 228	
<i>arion</i> , <i>Lycæna</i> 43, 92, 93, 109, 232, 233, 243, 256, 270, 272	
<i>armigera</i> , <i>Heliothis</i>	211
<i>arsilache var.</i> (<i>pales</i>), <i>Brenthis</i>	44
<i>artemis var.</i> (<i>aurinia</i>), <i>Melitæa</i>	89
<i>arundineta var.</i> (<i>neurica</i>), <i>Nonagria</i> 1, 2, 3, 4, 33, 34, 35, 36, 37, 56, 57, 58, 59	
<i>arundinis</i> , <i>Macrogaster</i>	306
<i>ashworthii</i> , <i>Agrotis</i>	76, 306, 307
<i>asiliformis</i> , <i>Egeria</i>	48, 83
<i>asperaria</i> , <i>Rhoptria</i>	162
<i>assimilata</i> , <i>Eupithecia</i>	64
<i>astasioides ab.</i> (<i>ilia</i>), <i>Apatura</i>	131
<i>asterie var.</i> (<i>aurelia</i>), <i>Melitæa</i>	225
<i>asteris</i> , <i>Cucullia</i>	267
<i>astrarche</i> (<i>agestis</i>), <i>Aricia</i> 52, 130, 147, 151, 156, 164, 198, 199, 202, 228, 270, 271, 272, 284, 285, 302, 307	
<i>atalanta</i> , <i>Pyrameis</i> 42, 47, 60, 66, 95, 105, 106, 107, 108, 111, 120, 124, 125, 131, 145, 151, 153, 163, 187, 197, 198	

	PAGE.
<i>athalia</i> , <i>Melitæa</i> 51, 52, 105, 155, 193, 202, 225, 233, 234, 246, 282, 283	
<i>atomaria</i> , <i>Ematurga</i> (<i>Fidonia</i>) 100, 143, 162, 268	
<i>atropos</i> , <i>Manduca</i>	23, 209
<i>aurago</i> , <i>Tiliacea</i>	250
<i>aurelia</i> , <i>Callicore</i>	268
<i>aurelia</i> , <i>Melitæa</i>	225, 233, 234
<i>aurella</i> , <i>Nepticula</i>	212
<i>auriciliella</i> , <i>Celastia</i>	201
<i>auricoma</i> , <i>Acronycta</i>	147
<i>auriflua</i> , <i>see similis</i> , <i>Porthesia aurina</i> (<i>artemis</i>), <i>Melitæa</i> 22, 43, 74, 89, 92, 130, 163, 212, 213, 219, 224, 228, 273, 274, 275, 305	
<i>aurita</i> , <i>Setina</i>	201, 223
<i>auroraria</i> (<i>muricata</i>), <i>Hyria</i>	244
<i>autumnaria</i> , <i>Ennomos</i> (<i>Eugonia</i>) 220, 244, 268, 296	
<i>autumnaria</i> , <i>Oporabia</i>	147
<i>aversata</i> , <i>Acidalia</i>	267
<i>axantha ab.</i> (<i>grossulariata</i>), <i>Abraxas</i>	296
<i>badiata</i> , <i>Anticlea</i>	64, 244
<i>badiipennella</i> , <i>Coleophora</i>	39, 40
<i>baia</i> , <i>Noctua</i> (<i>Amathes</i>) 91, 122, 212	
<i>balcanica</i> , <i>Lampides</i>	243
<i>baliodactyla</i> , <i>Wheeleria</i>	122, 143
<i>ballus</i> , <i>Thestor</i>	111
<i>balsamitæ</i> , <i>Cucullia</i>	246, 285
<i>barrettii var.</i> (<i>luteago</i>), <i>Luperina</i>	22
<i>barrowi</i> , <i>Binsitti</i>	126
<i>basilinea</i> , <i>Apamea</i>	61, 231
<i>batis</i> , <i>Thyatira</i> 52, 61, 90, 205, 207	
<i>baton</i> , <i>Scolitantides</i> 43, 93, 155, 156, 223	
<i>belia</i> , <i>Anthocharis</i>	111, 210, 211
<i>bellargus</i> , <i>Polyommatus</i> (<i>Agriades</i>) 43, 51, 88, 98, 109, 110, 130, 147, 155, 156, 187, 202, 219, 222, 226, 228, 231, 244, 256, 268, 286, 306, 307	
<i>bellus ab.</i> (<i>quercûs</i>), <i>Bithys</i>	165, 166
<i>bennetii</i> , <i>Agdistis</i> 53, 54, 231, 291	
<i>berberata</i> , <i>Anticlea</i>	174
<i>berisalensis var.</i> (<i>deione</i>), <i>Melitæa</i>	155
<i>betule</i> , <i>Ruralis</i> (<i>Thecla</i>) 75, 123, 147, 158, 166, 193, 221, 223, 302, 303	
<i>betularia</i> , <i>Amphidasys</i> 45, 76, 188	
<i>bicolor</i> , <i>Notodonta</i>	294
<i>bicolorana</i> , <i>Hylophila</i>	90
<i>bicoloria</i> (<i>furuncula</i>), <i>Miana</i> 205, 229, 231	
<i>bicuspis</i> , <i>Dicranura</i> 99, 124, 219, 244	
<i>bidentata</i> , <i>Gonodontis</i> (<i>Odontopera</i>) 52, 63, 124, 163, 220, 223, 306	
<i>bifida</i> , <i>Dicranura</i>	90, 244
<i>bilineata</i> , <i>Camptogramma</i> 64, 76, 224, 231	
<i>bilunaria</i> , <i>Selenia</i>	63
<i>binævella</i> , <i>Homæosoma</i> 206, 207	
<i>binaria</i> , <i>Drepana</i>	90

	PAGE.
bipunctidactyla, Adkinia (Stenop-tilia)	201, 228, 285
bipupillata <i>ab.</i> (pamphilus), Ccenonympha	89
biselliella, Tineola	267
bisetata, Acidalia	64
bistortata, Tephrosia	224
biundularia, <i>see</i> crepuscularia, Tephrosia	
bivirgæ <i>ab.</i> (psi), Acronycta	91
blanda, Caradrina	231
blandiata, Emmelesia	240, 270
blantina, <i>see</i> æthiops, Erebia	
blomeri, Asthena	64
Boarmiidae	162
bœticus, Lampides 67, 211, 243, 262	
borealis <i>var.</i> (fuliginosa), Phragmatobia	52
boreata, Cheimatobia	64
bractea, Plusia	100
brassicæ, Mamestra	91
brassicæ, Pieris 41, 51, 52, 64, 89, 104, 111, 144, 163, 209, 212, 226, 265, 272, 283	
briseis, Satyrus (Hipparchia) 130, 131, 149, 150, 151, 152, 157	
brumata, Cheimatobia	307
brunnea <i>var.</i> (dorilis), Loweia (Chrysophanus)	44
brunnea, Noctua	61, 306
brunnea <i>var.</i> (argyrognomon), Plebeius	44, 88
brunneata, Fidonia	215
bryoniæ <i>var.</i> (napi), Pieris 42, 120, 268	
bucephala, Phalera	90, 163
butlerowi <i>ab.</i> (w-album), Edwardsia (Thecla)	130, 166
cæca <i>ab.</i> (hyperanthus), Enodia (Aphantopus)	44, 45
cæca <i>ab.</i> (lappona), Erebia	43
cæca <i>ab.</i> (semiargus), Nomiades	44
cæcodromus <i>ab.</i> (tyndarus), Erebia 44	
cærulea <i>ab.</i> (bellargus), Agriades	306
cærulea <i>ab.</i> (icarus), Polyommatus 41	
cæruleocephala, Diloba	90, 251
cæruleopunctata <i>ab.</i> (pheretes), Polyommatus	43, 44
cæruleopunctata <i>ab.</i> (phlæas), Chrysophanus	41
cæsiata, Entephria (Larentia) 22, 216, 270	
cæsiella, Swammerdamia	307
cagnagellus, Hyponomeuta 185, 268	
caia (caja), Arctia 23, 100, 124, 212, 216, 220, 224, 230, 271, 296, 306	
calabra, Rhodostrophia	162
c-album, Polygonia 24, 89, 105, 107, 111, 124, 125, 126, 150, 155, 158, 174, 198, 223, 226, 283	
caliginosa, Acosmetia	205
callidice, Pontia (Pieris)	43, 92
Callophrys	97, 218
callunæ <i>var.</i> (quercûs), Lasiocampa 305	
camelina, Lophopteryx	61, 90, 292

	PAGE.
camilla, Limenitis 44, 93, 104, 105, 151, 156, 158, 197, 198, 223, 226, 282, 283	
canariensis, Agdistis	55
caudidata, Asthena	231
caniola, Lithosia 156, 220, 222, 244	
cannæ, Nonagria 52, 76, 268, 305	
capreolaria, Numeria	122
capriata <i>var.</i> (spartiata), Chesias 162	
capsincola, Dianthœcia	61
capucina <i>ab.</i> (oxyacanthæ), Miselia 61	
caradjæ <i>hybr.</i> , Malacosoma	50
cardamines, Euchloë 42, 89, 92, 95, 104, 121, 143, 163, 212, 230, 231, 283	
cardui, Pyrameis 42, 47, 66, 89, 105, 107, 108, 120, 125, 146, 156, 197, 198, 201, 211, 223, 264	
carniolica, Anthrocera 151, 156, 174, 175, 202, 260, 261	
carphodactylus, Hellinsia (Leipitilus) 78, 79, 99, 100, 122, 144, 187, 231	
carpinata <i>ab.</i> (quercinaria), Ennomos	220
carpini, <i>see</i> pavonia, Saturnia	
carpodactyla <i>see</i> carphodactylus, Hellinsia	
carpophaga, Dianthœcia	100, 212
carthami, Hesperia 43, 105, 202, 284	
cassandra (polyxena), Thais	111
cassinea, Petasia	163, 230
castanea, Noctua	306
castigata, Eupithecia	64
castrensis, Malacosoma 50, 220, 291, 294, 307	
Catocala	151, 155, 264
celerio, Hippotion	218
celina <i>ab.</i> (icarus), Polyommatus	41
celtis, Libythea	143, 282, 284
cembra, Scoparia	224
centralisata <i>var.</i> (oblongata), Eupithecia	307
cerago <i>see</i> fulvago, Citria	
ceronus <i>ab.</i> (bellargus), Agriades 43, 268	
cerri <i>ab.</i> (ilicis), Nordmannia (Thecla)	150, 151
cervinaria, Eubolia	76, 251
cespitalis, Herbula	206
cespitis, Luperina	91, 230
ceto, Erebia	43, 233
chalcobares <i>ab.</i> (grossulariata), Abraxas	84, 296, 304
chalcozona <i>ab.</i> (grossulariata), Abraxas	296, 304
chamomillæ, Cucullia	212
chaonia, Notodonta	52
chi, Polia	51, 61, 148, 277, 278
chlorana, Earias	292
christyi, Oporabia	147
chrysidiformis, Ægeria	52
chrysis, Plusia	51, 62, 91
chrysorrhœa, Porthesia	112
cinerea, Agrotis	205

	PAGE.		PAGE.
cingulata, Ennychia ..	206, 272	crabroniforme, Trochilium ..	103
cinnides <i>ab.</i> (bellargus), Agriades	268	cracæ, Toxocampa ..	220, 306
cinxia, Melitæa 89, 130, 150, 155,		crategi, Aporia 52, 89, 104, 111,	
158, 222, 225, 246, 283		112, 146, 147, 148, 152, 197,	
circe, Satyrus 104, 105, 150, 156,		260, 272, 283	
222, 228		crepuscularia (biundularia), Teph-	
circellaris, Mellinia ..	62, 250	rosia ..	63, 212, 224, 231
cirsiana, Ephippiphora ..	223	cribrum, Eulepia ..	207
cirsii <i>var.</i> (alveus), Hesperia		cristana, Peronea 99, 100, 308,	309
(Syrichthus) ..	130, 131	croceago, Hoporina ..	147
citrago, Tiliacea ..	62, 91, 250	crocealis, Ebulea ..	206
clara <i>ab.</i> (icarus), Polyommatus ..	307	cruciferarum (maculipennis), Plu-	
clathrata, Strenia (Chiasmia) 143,		tella ..	189
162, 295, 297, 304		cruda <i>see</i> pulverulenta, Tæniocampa	
cleodoxa <i>ab.</i> (adippe), Argynnis		cruttwelli <i>ab.</i> (solutella), Gele-	
104, 105, 131, 158, 284		chia ..	267
cleopatra, Gonepteryx 111, 156, 198		cubicularis, Caradrina ..	231
cloacella, Tinea ..	196	cucullatella, Nola ..	90, 207, 220
cloraria <i>ab.</i> (viridata), Nemoria ..	210	cucullina, Notodonta ..	163
clytie <i>ab.</i> (ilia), Apatura 44, 104,		culciformis, Egeria 48, 83, 267,	294
282, 283		culmellus, Crambus ..	215
c-nigrum, Noctua ..	163, 231, 251	curtula, Pygæa ..	307
cænosa, Lælia ..	124, 267, 294	cygnipennella, Elachista ..	212
combusta <i>ab.</i> (rurea), Xylophasia 61		cyllarus, Nomiades 68, 88, 130,	284
comma, Urbicola 151, 155, 174,		Cymatophorides ..	90
197, 198, 201, 202, 223, 226,		cynipiformis (asiliformis), Egeria	
228, 286		83, 187	
comma, Leucania ..	90	cynthia, Melitæa ..	43, 92
complanata, Lithosia ..	151	cyparissaria <i>ab.</i> (murinata), Minoa	162
complanula, Lithosia ..	174	cytisaria, <i>see</i> pruinata, Pseudoterpna	
concolor (extrema), Tapinostola ..	306	dahlui, Noctua ..	61
concomitella, Lithocolletis ..	147	damon, Polyommatus (Agriades)	
confluens <i>ab.</i> (dissimilis), Hadena	303	44, 152, 174, 199, 202, 214	
confusalis, Nola ..	60, 212	daphne, Brenthis ..	155, 282, 284
conigera, Leucania ..	90, 205, 230	daplidice, Pieris 23, 65, 150, 154,	
consignata, Eupithecia ..	147	156, 163, 164, 174, 197, 198,	
consonaria, Boarmia ..	231, 295	202, 211, 222, 228, 283	
consortaria, Boarmia ..	52, 295	dardanus, Papilio ..	127
conspersa, Dianthæcia ..	212, 306	darwiniana <i>var.</i> (arcania), Cæno-	
conspicillaris, Xylomiges ..	265	nympha ..	92, 198, 269, 271
conspicua, Fidonia 21, 45, 46, 174		davus, <i>see</i> typhon, Cænonympha	
conversaria <i>var.</i> (repandata), Boar-		deaurana, Lozopera ..	112
mia ..	219	decolorata, Emmelesia 64, 213,	
cordigera, Anarta ..	147, 306	224, 225	
cordula, Satyrus 131, 150, 156, 157,		decorata, Acidalia ..	151, 241
158, 261		decussata, Siona ..	245, 284
coronillaria <i>var.</i> (pruinata), Pseu-		defoliaria, Hybernica 46, 63, 73, 76, 120	
doterpna ..	161	deione, Brenthis ..	155, 158, 222
corsicaria, Pseudoterpna ..	161	delius, Parnassius ..	43, 44, 233
corticea, Agrotis ..	91, 205	delphinensella, Agdistis ..	53
corydon, Polyommatus (Agriades)		dentalis, Odontia ..	213, 223
24, 51, 98, 109, 110, 130,		dentina, Hadena ..	61, 205, 223, 224
147, 151, 152, 155, 156, 158,		derasa, Habrosyne (Gonophora,	
166, 174, 197, 198, 199, 202,		Thyatira) ..	61, 90, 205
206, 208, 219, 222, 226, 244,		derivata, Anticlea ..	306
256, 261, 267, 268, 271, 285,		deschazei <i>var.</i> (lubricipeda), Spilo-	
286, 306		soma ..	267, 294
corylata, Cidaria ..	64	designata (propugnata), Coremia	
coryli, Demas ..	61	64, 231	
cossus, Cossus ..	215	dia, Brenthis 89, 92, 105, 150, 155,	
costæstrigalis, Hypenodes ..	63	158, 193, 222, 225, 228	
costalis, Pyralis (Hypsopygia) 215, 250		Dianthæciæ ..	214
costipunctana, Epiblema ..	217	dictæa, Notodonta ..	90
costovata <i>var.</i> (fluctuata), Mela-		dictynna, Melitæa 89, 105, 131,	
nippe ..	148	225, 228, 270	

	PAGE.
didyma, Apamea	91
didyma, Melitæa	104, 105, 131,
150, 155, 158, 174, 191, 197,	
202, 222, 225, 228, 232,	
246, 261, 283	
didymata, Larentia	64
diluta, Cymatophora	61
dilutata, Oporabia	147, 307
diminuta ab. (potatoria), Cosmo-	
triche	119
dipsacea, Heliothis 151, 207, 208,	
223, 246, 284	
discordella, Coleophora 196, 212, 224	
dispar, Chrysophanus 90, 98, 163,	
164, 193, 217, 245, 284	
dispar, Porthetria	282, 284
dissimilis, Hadena	303
dissoluta, Nonagria 1, 2, 34, 56,	
57, 58, 59	
dodonea, Notodonta	90
dodoneata, Eupithecia	244
dolabraria, Eurymene	207, 231
dominula, Callimorpha	243
donzelii, Polyommatus	12, 201
dorilis, Loweia 44, 88, 92, 130,	
131, 155, 157, 174, 200, 222,	
226, 245, 271, 284	
dorylas, Polyommatus	193
dorus, Ctenonympha 154, 155,	
156, 157, 158, 173, 222, 223	
doubledayaria var. (betularia), Am-	
phidasys	76
Drepanulides	90
dromedarius, Notodonta	61, 292
dryas, Enodia (Satyrus) 130, 157,	
222, 226	
dubitalis, Scoparia	207, 231
dubitata, Scotosia	64, 216, 230
duplaris, Cymatophora 52, 90,	
124, 206	
duponcheli, Leptidia	155, 223
edusa, Colias 111, 130, 150, 152,	
155, 156, 163, 164, 174, 189,	
197, 198, 201, 202, 211, 222,	
226, 228, 265	
egeria, Polygonia	155
egeria, Pararge 43, 89, 105, 111,	
130, 155, 163, 187, 267, 271, 309	
egerides var. (egeria), Pararge 43,	
89, 105, 130	
elinguaria, Crocallis	216, 220
elpenor, Eumorpha	60
elutata, see sordidata, Hypsipetes	
emarginata, Acidalia	174
emutaria, Acidalia	205
Eois = Ptychopoda	161
eos ab. (ilia), Apatura	104, 105
epilobii hybr., Hyles	265
epiphron, Erebia 44, 213, 216,	
223, 224	
equestraria var. (quercinaria),	
Ennomos	220
ergane, Pieris	267
ericellus, Crambus	224
ericetella, Gelechia	223

	PAGE.
eris ab. (niobe), Argynnis 105,	
245, 284	
eros, Polyommatus	198, 199, 201
escheri, Polyommatus 43, 174,	
198, 202	
eumedon, Aricia	43, 244, 270
euphemus, Lycæna	42, 44, 130, 131
euphorbiæ, Hyles	152, 268
euphorbiata, see murinata, Minoa	
euphrosyne, Brenthis 42, 89, 124,	
130, 153, 154, 187, 231, 232,	
271	
euryale, Erebia 43, 197, 232, 233,	
269, 271, 284	
eurybia var. (hippotoë), Chryso-	
phanus	43
eviades ab. (medusa), Erebia	132
exanthemaria, Cabera	63, 223
exclamationis, Agrotis 61, 91,	
196, 215, 229, 231	
exigua, Laphygma 27, 46, 52, 74,	
76, 146, 209, 214	
exoleta, Calocampa	196
extersaria, Tephrosia	63
extranea, see unipuncta, Leucania	
extrema, see concolor, Tapinostola	
exulans, Anthrocera	201
fagi, Stauropus	52, 244
faginella, Lithocolletis	212
falcataria, Drepana	61, 90
familiella, Crinopteryx	112
farinalis, Pyralis	215
farinatella, Cedestis	219
fasciaria, see prosapiaria, Ellopia	
fasciata var. (lubricipeda), Spilo-	
soma	267
fasciata ab. (malvæ), Hesperia	130
fasciuncula, Miana	91, 224, 231
fausta, Anthrocera	174, 202, 222
favicolor, Leucania	45, 76, 290, 291
ferrugata, Coremia	64
fervida var. (rubi), Callophrys	152
festiva, Noctua 61, 91, 163, 205, 212, 213	
ficklini ab. (luteago), Dianthæcia 305	
fidia, Hipparchia 155, 156, 157, 222	
filigrammaria, Oporabia	74
filipendulæ, Anthrocera 60, 151,	
175, 189, 261, 307	
fimbria, Triphæna	61, 91, 205
fimbrialis, Thaleria	75, 97, 105,
235, 247, 248	
fissipuncta see epsilon, Orthosia	
flammea, Meliana	76
flammealis, Endotricha	223
flava (thauimas, lineæ), Adopæa 41,	
105, 164, 174, 197, 202, 271, 305	
flavago, Citria	91, 250
flavago, Gortyna	61
flavalis, Botys 156, 206, 223, 228	
flavescens ab. (fulvago), Citria	250
flavicincta, Polia	22, 61, 148
flavicornis, Asphalia 61, 74, 212	
flavofasciata, Erebia	43, 45
flavofasciata ab. (grossulariata),	
Abraxas	84, 193, 296
fluctuata, Melanippe 148, 212, 231	

	PAGE.		PAGE.
fluviata, <i>Camptogramma</i> ..	251	glyphica, <i>Euclidia</i> ..	62
fontis, <i>Bomolocha</i> ..	63	gnaphalii, <i>Cucullia</i> ..	219, 304
forficulis, <i>Pionea</i> ..	250	goante, <i>Erebica</i> 198, 199, 201, 269,	302
fortificata <i>ab.</i> (<i>decussata</i>), <i>Siona</i>	245, 284	gonostigma, <i>Orgyia</i> ..	124, 291
fowleri <i>ab.</i> (<i>corydon</i>), <i>Agriades</i> ..	208	gordius <i>var.</i> (<i>alciphron</i>), <i>Loweia</i>	(<i>Chrysophanus</i>) 156, 158,
fracta <i>ab.</i> (<i>atalanta</i>), <i>Pyrameis</i> ..	42		174, 197, 202
frankenie, <i>Agdistis</i> ..	53, 54, 55	gorge, <i>Erebica</i> ..	43, 44, 92, 201
fraxini, <i>Catocala</i> ..	228	gothica, <i>Tæniocampa</i> 61, 91, 124,	220
frustrata, <i>Larentia</i> ..	162	gothicina <i>ab.</i> (<i>gothica</i>), <i>Tænio-</i>	<i>campa</i> ..
fuliginaria, <i>Boletobia</i> ..	100		220
fuliginosa, <i>Phragmatobia</i> 52, 61,	212	gracilis, <i>Tæniocampa</i> ..	62, 290
fulva, <i>Tapinostola</i> ..	61, 90	graminis, <i>Chæræas</i> ..	263
fulvago (<i>cerago</i>), <i>Citria</i> 222, 229,	250	graphodactyla, <i>Stenoptilia</i> ..	296
fulvapicata <i>ab.</i> (<i>grossulariata</i>),		grisealis, <i>Herminia</i> ..	63
<i>Abraxas</i> ..	295	griseocapitella <i>ab.</i> (<i>cæsiella</i>), <i>Swam-</i>	<i>merdamia</i> ..
fulvata, <i>Cidaria</i> ..	64		307
fulvocinctata <i>var.</i> (<i>frustrata</i>),		gristola, <i>Lithosia</i> ..	206
<i>Larentia</i> ..	162	grossulariata, <i>Abraxas</i> 63, 83, 84,	
fumata <i>ab.</i> (<i>conspiciuata</i>), <i>Fidonia</i>	21, 45		193, 209, 216, 218, 243, 263,
			267, 290, 295, 296, 297, 304,
furcatellus, <i>Crambus</i> ..	224		306, 307
furcula, <i>Cerura</i> ..	292	gryphipennella, <i>Coleophora</i> 87,	212
furuncula, <i>see</i> <i>bicoloria</i> , <i>Miana</i>		gumpiana <i>ab.</i> et <i>var.</i> (<i>cristana</i>),	
fuscantaria, <i>Ennomos</i> ..	268	<i>Peronea</i> ..	99, 100
fuscata <i>ab.</i> (<i>leucophearia</i>), <i>Hybernia</i>	220	haggerti <i>var.</i> (<i>pulverulenta</i>),	
fuscedinella, <i>Coleophora</i> ..	40	<i>Tæniocampa</i> ..	52
fuscovenosa (<i>interjectaria</i>), <i>Ptycho-</i>		harpagula (<i>sicula</i>), <i>Drepana</i> 267,	
<i>poda</i> ..	161		294, 304
fuscoviridella, <i>Glyphipteryx</i> ..	223	hastata, <i>Rheumaptera</i> (<i>Melanippe</i>)	
fuscula, <i>Erastris</i> ..	188		64, 162
fuscus, <i>see</i> <i>pterodactyla</i> , <i>Stenop-</i>			74, 303
<i>tilia</i>		hazeleighensis <i>ab.</i> (<i>grossulariata</i>),	
fylgia <i>ab.</i> (<i>eumedon</i>), <i>Aricia</i> ..	43	<i>Abraxas</i> ..	295
galactodactyla, <i>Porritia</i> ..	231	hecate, <i>Brenthis</i> ..	246, 283
galathea (<i>tea</i>), <i>Melanargia</i> 89, 92,		hectus, <i>Hepialus</i> ..	60, 294
		helice <i>ab.</i> (<i>edusa</i>), <i>Colias</i> ..	152, 174
		<i>Heliopeltis</i> ..	218
		<i>Hemithea</i> ..	236
		heparata, <i>Eupisteria</i> ..	64
		hepatica, <i>Xylophasia</i> ..	205
		<i>Hepialides</i> ..	90
		hera, <i>Callimorpha</i> 119, 156, 157,	
			174, 225
		hermione, <i>Satyrus</i> 105, 154, 155,	
			156, 157, 158, 222
		hero, <i>Cænonympha</i> ..	89, 105
		herrichi <i>ab.</i> (<i>palæno</i>), <i>Colias</i> ..	44
		hessii (<i>neurica var.</i>), <i>Nonagria</i> 3,	
			4, 36, 56, 57, 58
		hethlandica <i>var.</i> (<i>humuli</i>), <i>Hepi-</i>	
		<i>alus</i> ..	294
		hexadactyla, <i>Orneodes</i> ..	208
		hexapterata, <i>Lobophora</i> ..	64
		heydenii, <i>Agdistis</i> ..	55
		hiera, <i>Pararge</i> ..	42, 272
		hippomedusa <i>var.</i> (<i>medusa</i>), <i>Erebica</i>	
			130, 132
		hippothoe, <i>Chrysophanus</i> 43, 92,	
			193, 199, 200, 271, 307
		hispana <i>ab.</i> (<i>corydon</i>), <i>Agriades</i> ..	130
		humiliata, <i>Ac dalia</i> ..	204
		humuli, <i>Hepialus</i> ..	60, 90, 294

PAGE.

hyale, <i>Colias</i> 89, 104, 150, 155, 156, 163, 164, 174, 197, 198, 201, 202, 222, 226, 228, 246, 283, 309	
hyas (dorylas), <i>Polyommatus</i> 44, 130, 151, 155, 158, 193, 222, 226, 228, 284	
hydara, <i>Heliconius</i> 76	
hydrata, <i>Larentia</i> 105	
hyerana, <i>Hastula</i> .. 51, 76, 99, 100	
<i>Hylophilides</i> 90	
hyperanthus, <i>Enodia</i> (<i>Aphantopus</i>) 44, 45, 92, 105, 131, 151, 164, 206, 209, 266	
ianira (janira), <i>Epinephele</i> 42, 52, 89, 92, 105, 150, 151, 163, 174, 189, 222, 224, 226, 263, 284, 285, 286, 302	
ianthina (janthina), <i>Triphæna</i> 61, 74, 91	
icarinus <i>ab.</i> (<i>icarus</i>), <i>Polyommatus</i> 166, 202, 226	
icarus (<i>alexis</i>), <i>Polyommatus</i> 41, 51, 89, 108, 109, 110, 130, 147, 151, 152, 155, 156, 158, 164, 166, 188, 189, 197, 202, 213, 219, 222, 224, 225, 226, 228, 240, 243, 256, 270, 271, 284, 285, 286, 305, 307	
ichneumoniformis, <i>Egeria</i> .. 206	
ichnusoides <i>ab.</i> (<i>urtice</i>), <i>Aglais</i> .. 305	
ilia, <i>Apatura</i> 44, 104, 105, 131, 145, 282, 283	
iliades <i>ab.</i> (<i>ilia</i>), <i>Apatura</i> .. 104, 105	
ilicifolia, <i>Epicnaptera</i> 124	
ilicis, <i>Nordmannia</i> (<i>Thecla</i>) 93, 104, 121, 146, 150, 151, 246, 283, 284	
imitaria, <i>Acidalia</i> 207	
immaculata <i>ab.</i> (<i>rubi</i>), <i>Callophrys</i> 88	
immanata, <i>Cidaria</i> 64	
immorata, <i>Acidalia</i> 228	
immundella, <i>Trifurecula</i> 244	
impluviata, <i>Hypsipetes</i> 292	
impura, <i>Leucania</i> 90, 205, 230, 291	
incerta, <i>Tæniocampa</i> .. 62, 91, 220	
Incisalia 218	
infirmaria, <i>Ptychopoda</i> 162	
infuscata <i>ab.</i> (<i>monoglypha</i>), <i>Xylo-</i> <i>phasia</i> 243	
infuscata <i>ab.</i> (<i>quercinaria</i>), <i>En-</i> <i>nomos</i> 220	
ingens, <i>Agdistis</i> 55	
inguinata <i>var.</i> (<i>procellata</i>), <i>Melanippe</i> 100	
initia <i>ab.</i> (<i>phlæas</i>), <i>Rumicia</i> 41	
initia-caudata <i>ab.</i> (<i>phlæas</i>), <i>Rumicia</i> 41	
ino, <i>Brenthis</i> 42, 43, 130, 233, 272	
inornata <i>ab.</i> (<i>delius</i>), <i>Parnassius</i> .. 44	
interjecta, <i>Triphæna</i> 207	
interjectaria (<i>fuscovenosa</i>), <i>Ptycho-</i> <i>poda</i> 161	
intermedia <i>ab.</i> (<i>adippe</i>), <i>Argynnis</i> 131	
intermedia <i>var.</i> (<i>egeria</i>), <i>Pararge</i> 130	
intermedia <i>ab.</i> (<i>phlæas</i>), <i>Rumicia</i> (<i>Chrysophanus</i>) .. 41, 243	
interrogationis, <i>Polygonia</i> .. 126	

PAGE.

io, <i>Vanessa</i> 41, 60, 89, 105, 106, 107, 120, 121, 126, 144, 151, 153, 154, 163, 277, 283, 285	
iole <i>ab.</i> (<i>iris</i>), <i>Apatura</i> 104, 105, 131	
iota, <i>Plusia</i> 62	
iphis, <i>Cænonympha</i> 41, 43, 45, 131, 198, 199, 245, 284	
iphis <i>ab.</i> (<i>icarus</i>), <i>Polyommatus</i> .. 41	
iris, <i>Apatura</i> 104, 105, 131, 145, 282, 283, 309	
irreorella, <i>Setina</i> .. 204, 206, 223	
isocrates, <i>Virachola</i> 211	
isogrammata, <i>Eupithecia</i> 64, 207, 231, 271	
jacobææ, <i>Euchelia</i> 61, 90, 207, 219, 267, 286	
janira <i>see</i> ianira, <i>Epinephele</i>	
janthina <i>see</i> ianthina, <i>Triphæna</i>	
japygia, <i>Melanargia</i> 245, 246, 284	
jasieneata, <i>Eupithecia</i> 306	
jasius, <i>Charaxes</i> 76, 124	
jesous, <i>Lampides</i> 243	
johni <i>hybr.</i> , <i>Eutricha</i> 242	
juliania <i>var.</i> (<i>bilunaria</i>), <i>Selenia</i> .. 63	
jurtina (janira), <i>see</i> ianira, <i>Epinephele</i>	
krishna, <i>Papilio</i> 268	
laburnella, <i>Cemiostoma</i> 220	
lactinaria, <i>Drepana</i> .. 61, 90	
lactearia, <i>Iodis</i> 75, 231	
lacteasparsa <i>ab.</i> (<i>grossulariata</i>), <i>Abraxas</i> .. 84, 295, 304	
lacteomarginata <i>ab.</i> (<i>picata</i>), <i>Cidaria</i> 239, 240, 295, 304	
lacticolor <i>ab.</i> (<i>flavofasciata</i> = <i>grossu-</i> <i>lariata</i>), <i>Abraxas</i> 193, 296, 304	
langei <i>ab.</i> (<i>chi</i>), <i>Polia</i> .. 277, 278	
lapidella, <i>Luffia</i> 142	
lappona, <i>Erebia</i> 43, 92, 93	
laponaria, <i>Nyssia</i> 100, 124, 220, 306	
lariciata, <i>Eupithecia</i> 64	
lathonia (<i>latona</i>), <i>Issoria</i> 89, 105, 152, 158, 164, 196, 197, 198, 202, 215, 216, 228, 246, 284	
lavateræ, <i>Erynnis</i> 158, 284	
leporina, <i>Acronycta</i> 52, 61, 76, 209, 292	
lerinensis (<i>lerinsis</i>), <i>Agdistis</i> 53, 54, 55	
lerinsis = <i>lerinensis</i> , <i>Agdistis</i> .. 53	
leucomelas <i>ab.</i> (<i>galathea</i>), <i>Melan-</i> <i>argia</i> 150, 307	
leucophæa, <i>Pachetra</i> 146	
leucophæaria, <i>Hybernia</i> 63, 163, 220	
levana, <i>Araschnia</i> .. 42, 89, 126	
libatrix, <i>Gonoptera</i> 62	
lichenaria, <i>Cleora</i> 207, 290	
lichenella, <i>Solenobia</i> 75	
ligea, <i>Erebia</i> 43, 44, 92	
ligula, <i>Cerastis</i> 250	
ligustri, <i>Craniophora</i> 205	
ligustri, <i>Sphinx</i> 60, 231	
<i>Limenitis</i> 246	
limitata, <i>Eubolia</i> 64	
limosipennella, <i>Coleophora</i> 39, 40	
linariata, <i>Eupithecia</i> 231	
lineola, <i>Adopæa</i> 150, 198, 202, 270, 271, 284	

	PAGE.
<i>lithodactyla</i> , <i>Oidematophorus</i>	122, 231
<i>lithorhiza</i> , <i>Xylocampa</i>	62
<i>lithoxylea</i> , <i>Xylophasia</i>	90, 224, 231
<i>litura</i> , <i>Anchocelis</i>	62, 250
<i>livia</i> , <i>Hypolycæna</i>	211
<i>livornica</i> , <i>Phryxus</i> 146, 152, 214,	218
<i>lobulata</i> , <i>Lobophora</i>	64
<i>loewii</i> , <i>Plebeius</i>	211
<i>loniceræ</i> , <i>Anthrocera</i> 175, 202, 260,	261, 271
<i>lorquiniana</i> , <i>Acalla</i>	76
<i>lota</i> , <i>Orthosia</i>	62
<i>lubricipeda</i> , <i>Spilosoma</i> 209, 213,	215, 266, 267, 294, 304
<i>lucernea</i> , <i>Agrotis</i>	205
<i>lucilla</i> , <i>Neptis</i>	282, 283
<i>lucina</i> , <i>Hamearis</i> (<i>Nemeobius</i>) 42,	55, 92, 105, 107, 243
<i>lucipara</i> , <i>Euplexia</i>	91
<i>luctuosa</i> , <i>Acontia</i>	151, 156, 174
<i>lunædactyla</i> , <i>Marasmarcha</i> 159,	189
<i>lunigera</i> , <i>Agrotis</i>	204
<i>lunosa</i> , <i>Anchocelis</i>	91, 250
<i>lupulinus</i> , <i>Hepialus</i>	60
<i>lurideola</i> , <i>Lithosia</i>	61, 205
<i>lutea ab.</i> (<i>favicolor</i>), <i>Leucania</i> 45,	76
<i>lutea ab.</i> (<i>grossulariata</i>), <i>Abraxas</i>	83, 84, 295, 296
<i>lutea-lacticolor ab.</i> (<i>grossulariata</i>),	<i>Abraxas</i> 296, 304
<i>luteago</i> , <i>Luperina</i>	22, 305
<i>luteata</i> , <i>Assthenia</i>	64
<i>luteolaria</i> , <i>Sterrhæa</i>	161
<i>luteolata</i> , <i>Rumia</i>	231
<i>lutescens ab.</i> (<i>hera</i>), <i>Callimorpha</i> 119	
<i>lutipennella</i> , <i>Coleophora</i>	40
<i>lutulenta</i> , <i>Epunda</i>	251
<i>lycaon</i> , <i>Epinephele</i> 150, 151, 156,	157, 174, 197, 202, 226, 261, 284
<i>lychnitis</i> , <i>Cucullia</i>	244
<i>lyllus ab.</i> (<i>pamphilus</i>), <i>Cænonympha</i> 42	
<i>Lymantriides</i>	90
<i>lysimon</i> , <i>Polyommatus</i>	211
<i>lyssa var.</i> (<i>megæra</i>), <i>Pararge</i>	66
<i>machaon</i> , <i>Papilio</i> .. 64, 73, 89, 95,	130, 143, 150, 163, 196, 226, 276, 283, 306
<i>macilenta</i> , <i>Orthosia</i>	62
<i>macularia</i> (<i>maculata</i>), <i>Venilia</i> 63,	231
<i>maculipennis</i> (<i>cruciferarum</i>), <i>Plutella</i>	189
<i>mæra</i> , <i>Pararge</i> 89, 100, 105, 152,	155, 158, 197, 198, 202, 222, 226, 244, 261, 269, 271, 284
<i>major var.</i> (<i>loniceræ</i>), <i>Anthrocera</i> 261	
<i>malinellus</i> , <i>Yponomeuta</i>	189, 190
<i>malivorella</i> , <i>Yponomeuta</i>	190
<i>malvæ</i> , <i>Hesperia</i> 88, 95, 130, 131,	147, 187, 231, 260, 284
<i>manicata</i> , <i>Agdistis</i>	55
<i>Marasmarcha</i>	158, 174, 203
<i>margaritata</i> (<i>aria</i>), <i>Metrocampa</i>	63
<i>marginaria</i> , <i>Hybernia</i> 147, 212,	231
<i>marginata</i> (<i>us</i>), <i>Heliothis</i>	163
<i>marginepunctata</i> (<i>promutata</i>), <i>Ac-</i>	

	PAGE.
<i>dalia</i>	206, 223
<i>marmorinaria ab.</i> (<i>leucophæaria</i>),	<i>Hybernia</i> 220
<i>masculella</i> , <i>Incurvaria</i>	212
<i>mathewi ab.</i> (<i>viridata</i>), <i>Nemoria</i>	210
<i>matura</i> , <i>Cerigo</i>	90, 228, 229
<i>maturna</i> , <i>Melitæa</i> 43, 44, 105, 265,	282, 283
<i>maura</i> , <i>Mania</i>	91
<i>medusa</i> , <i>Erebia</i> 89, 130, 132, 282, 284	
<i>megacephala</i> , <i>Cuspidia</i>	61
<i>megæra</i> , <i>Pararge</i> 66, 89, 111, 130,	155, 158, 163, 212, 226
<i>mehadiensis ab.</i> (<i>athalia</i>), <i>Melitæa</i>	282, 283
<i>melaina ab.</i> (<i>cratægi</i>), <i>Aporia</i>	89
<i>melampus</i> , <i>Melampias</i> (<i>Erebia</i>)	270, 271
<i>melanopa</i> , <i>Anarta</i>	132, 306
<i>melanozona ab.</i> (<i>grossulariata</i>),	<i>Abraxas</i> 296, 304
<i>melas</i> , <i>Erebia</i>	282, 284
<i>meleager</i> , <i>Polyommatus</i> 151, 157,	174, 222
<i>meliloti</i> (<i>vicinæ</i>), <i>Anthrocera</i> 207,	264
<i>Melitæa</i>	155
<i>mendica</i> , <i>Spilosoma</i>	90
<i>mensuraria</i> , <i>Eubolia</i>	271
<i>menthastri</i> , <i>Spilosoma</i>	213, 224
<i>menyanthidis</i> , <i>Acronycta</i> .. 51, 91,	212
<i>meridionalis</i> , <i>Agdistis</i>	55
<i>merope var.</i> (<i>aurinia</i>), <i>Melitæa</i> 43,	92
<i>mesomella</i> , <i>Lithosia</i>	207
<i>meticulosa</i> , <i>Phlogophora</i> 62, 224,	251
<i>metis ab.</i> (<i>ilia</i>), <i>Apatura</i>	131
<i>metra var.</i> (<i>rapæ</i>), <i>Pieris</i>	41
<i>mi</i> , <i>Euclidia</i>	62, 91
<i>miata</i> , <i>Cidaria</i>	52, 64
<i>micana</i> , <i>Sericoris</i>	273
<i>microdactyla</i> , <i>Adaina</i>	79
<i>migadactyla</i> (<i>spilodactyla</i>), <i>Wheel-</i>	<i>eria</i> 188, 206
<i>minima</i> , <i>Agdistis</i>	55
<i>minima</i> , <i>Cupido</i> 88, 130, 147, 166,	213, 232, 270, 284
<i>minos</i> , <i>see purpuralis</i> , <i>Anthrocera</i>	
<i>minutata</i> , <i>Eupithecia</i>	224
<i>mnemosyne</i> , <i>Parnassius</i> 42, 245,	282, 283
<i>mnestra</i> , <i>Erebia</i>	44, 233
<i>monacha</i> , <i>Lymantria</i> 52, 119, 120,	208, 282, 284
<i>moneta</i> , <i>Plusia</i>	52
<i>monodactyla</i> , <i>Emmelina</i>	223, 250
<i>monoglyphæ</i> (<i>polyodon</i>), <i>Xylophasia</i>	90, 122, 205, 215, 231, 243, 291
<i>montanata</i> , <i>Melanippe</i>	223, 270
<i>mori</i> , <i>Bombyx</i>	286
<i>morio</i> , <i>Hypogymna</i>	245, 284
<i>morpheus</i> , <i>Caradrina</i> 91, 231,	284
<i>morpheus</i> , <i>Heteropterus</i>	246
<i>munda</i> , <i>Tæniocampa</i>	62
<i>mundana</i> , <i>Nudaria</i>	60
<i>muralis</i> (<i>glandifera</i>), <i>Bryophila</i> 62,	268
<i>muricata</i> (<i>auroraria</i>), <i>Hyria</i>	244

	PAGE.
<i>murinata</i> , Minoa	64, 162
<i>muscerda</i> , Lithosia	123
<i>myrmidone</i> , Colias	245, 246, 283
<i>myrtilli</i> , Anarta	147, 207
<i>nama</i> , Hestina	268
<i>nanodes</i> , Agdistis	55
<i>napæ var.</i> (pales), Brenthis	200
<i>napææ ab.</i> (napi), Pieris	268, 283
<i>napi</i> , Pieris 42, 89, 104, 120, 124, 163, 212, 268, 272, 283	
<i>nebulosa</i> , Aplecta 52, 61, 91, 306, 307, 308	
<i>neglecta var.</i> (castanea), Noctua	306
<i>nelamus var.</i> (epiphron), Erebia	44
<i>memorana</i> , Simaethis	223
<i>neoridas</i> , Erebia 150, 155, 157, 159, 174, 197, 198, 202, 222	
<i>Neptis</i>	246
<i>neurica</i> , Nonagria 1, 2, 3, 4, 33, 34, 35, 36, 37, 56, 57, 58, 59	
<i>neustria</i> , Malacosoma 50, 98, 220, 230	
<i>nexa</i> , Nonagria	35
<i>nictitans</i> , Hydrocæa	61, 90
<i>nigra var.</i> (bidentata), Odontopera (Gonodontis)	306
<i>nigrescens ab.</i> (chi), Polia	278
<i>nigrescens ab.</i> (upsilon), Orthosia	243
<i>nigricans</i> , Agrotis	205
<i>nigricans var.</i> (orion), Scolitantides	246, 284
<i>nigricella</i> , Coleophora	40, 212
<i>nigrocincta var.</i> (xanthomista), Polia	268, 305
<i>nigrocincta ab.</i> (chi), Polia	278
<i>nigrocosta ab.</i> (saucia), Peridroma	250
<i>nigrofasciata</i> (aria), Anticlea 64, 212	
<i>nigrolutea ab.</i> (grossulariata), Abraxas 83, 267, 295, 304	
<i>nigromaculana</i> , Phoxopteryx	224
<i>nigrosparsata ab.</i> (grossulariata), Abraxas 84, 243, 295, 296, 304	
<i>niobe</i> , Argynnis 92, 105, 197, 198, 201, 202, 226, 233, 245, 271, 284, 302	
<i>nitens ab.</i> (thrasonella), Glyphipteryx	219
<i>niveata</i> , Cleogene	267
<i>Noctuides</i>	90
<i>Nolides</i>	90
<i>Nonagria</i>	1, 34, 58
<i>notata</i> , Macaria	63
<i>Notodontides</i>	90
<i>nubeculosa</i> , Petasia	76
<i>nupta</i> , Catocala 91, 61, 228, 263, 264	
<i>Nymphalidæ</i>	106
<i>nymphaea</i> , Hydrocampa	208
<i>obfuscata</i> , Gnophos	201, 270
<i>obliquaria</i> , Chesias	64
<i>oblongata</i> , Eupithecia 231, 244, 307	
<i>obscura var.</i> (arion), Lycæna 43, 92	
<i>obscura ab.</i> (sylvata), Abraxas	21
<i>obscura</i> , Agrotis	244
<i>obscura ab.</i> (trilinea), Grammesia	243
<i>obscuraria</i> , Gnophos	206, 208
<i>obsoleta</i> , Leucania	290, 291

	PAGE.
<i>obsoleta var.</i> (agestis), Aricia	52
<i>obsoleta ab.</i> (corydon), Agriades	267
<i>obsoleta ab.</i> (icarus), Polyommatus	243
<i>obsoleta ab.</i> (pamphilus), Cœonympha	42
<i>occidentalis var.</i> (didyma), Melitæa	131
<i>occulta</i> , Aplecta	291
<i>ocellaris</i> , Mellinia	166, 250
<i>ocellata</i> , Smerinthus 47, 163, 219, 220, 291, 292	
<i>ocellata ab.</i> (pamphilus), Cœonympha	42, 89
<i>ochracea</i> , Gortyna	265
<i>ochracea ab.</i> (anceps), Mamestra	147
<i>ochrodactyla</i> , Gillmeria	206
<i>ochsenheimeri</i> , Anthrocera	202, 261
<i>octomaculalis</i> (ata), Ennychia	264, 272
<i>oleracea</i> , Hadena	91
<i>olivacea var.</i> (chi), Polia	277
<i>ononaria</i> , Aplaneta	97
<i>opima</i> , Tæniocampa	100, 220
<i>optilete</i> , Polyommatus	43, 44, 270
<i>orbifer</i> , Powellia	245, 284
<i>orbitulus</i> , Polyommatus	43, 44
<i>orbona</i> , Triphæna	61
<i>orion</i> , Diphthera	100
<i>orion</i> , Scolitantides	246, 284
<i>orion</i> , Moma	207, 306
<i>ornata</i> , Acidalia	151, 174, 189, 231
<i>ornata ab.</i> (astrarche), Aricia	52
<i>ornata ab.</i> (podalirius), Papilio	89
<i>ornatipennella</i> , Coleophora	198
<i>osseana</i> , Aphelia	75
<i>osteodactyla</i> , Hellinsia	78, 79, 122
<i>ostrinalis</i> , Pyrausta	206
<i>oxyacanthæ</i> , Miselia	61, 91
<i>oxydata ab.</i> (subfulvata), Eupithecia	24
<i>Oxyptilus</i>	271
<i>padellus</i> , Yponomeuta	189, 190
<i>palæmon</i> , Cyclopides 42, 88, 92, 105, 260, 270, 271	
<i>palæno</i> , Colias	43, 44
<i>palealis</i> , Spilodes	243
<i>pales</i> , Brenthis	44, 200, 233, 269
<i>palleana</i> , Tortrix	212
<i>pallens</i> , Leucania 90, 224, 229, 230, 291	
<i>pallescentella</i> , Tinea	52
<i>pallida var.</i> (semele), Hipparchia	132
<i>pallida ab.</i> (stabilis), Tæniocampa	147
<i>palpina</i> , Pterostoma	61
<i>paludicola</i> , Nonagria 2, 3, 34, 35	
<i>pamphilus</i> , Cœonympha 42, 52, 67, 89, 95, 104, 105, 154, 163, 174, 189, 197, 199, 202, 222, 223, 224, 226, 263, 266, 284, 285	
<i>pandalis</i> , Botys	231
<i>pandora</i> , Argynnis (Dryas)	246, 284
<i>paphia</i> , Dryas 22, 41, 89, 105, 124, 148, 151, 154, 155, 156, 158, 174, 198, 207, 208, 219, 232, 243, 269, 271, 282, 284, 309	
<i>papilionaria</i> , Geometra 63, 234, 248, 278, 279, 280, 291, 307	

	PAGE.		PAGE.
paralia, Agdistis	54	pomifoliella, Lithocolletis	212
parthenias, Brepheos	63, 121, 212	popularis, Neuronina	61, 90
parthenie, Melitea 43, 89, 105,		populata, Cidaria	64, 74, 215
131, 150, 158, 225, 228, 270, 272		populeti, Tæniocampa	62
pastinum, Toxocampa 76, 205, 206,	213	populi, Amorpha	215, 219, 307
paula, Thalpocharis	209	populi, Limenitis 43, 104, 105, 282,	283, 307
pavonia (carpini), Saturnia	147,	populi, Pœcilocampa	61
220, 223, 306		populifolia, Eutricha	242
pectinataria <i>see</i> (viridaria), La-		porata, Zonosoma	295
rentia		porcellus, Theretra	243
pedaria, Phigalia	43, 124	porrinata, Nemoria	100
peletieraria (eria), Cleogene	162, 267	potatoria, Cosmotriche 119, 212,	224, 244
peltigera, Heliothis	146, 214, 306	præformata, Anaitis	162
pennaria, Himera	236, 305	præata, Scirpophaga	99
pennigeraria, Athroolopha	162	prasina, Geometra	248
penziana, Sciaphila	75	prasinana, Hylophila	90, 205
penzigi <i>hybr.</i> , Malacosoma	50	pratellus, Crambus	223
perfumaria <i>var.</i> (gemmaria), Boar-		prieuri, Hipparchia	131, 150, 157
mia	306	proboscidalis, Hypena	63, 91, 224
perla, Bryophila	62, 90	procellata, Melanippe	64, 100
persicaria, Mamestra	91, 163	prodromana, Amphysa	212
petraria, Panagra	63	progemmaria, <i>see</i> marginaria,	
petrificata, Xylina	62	Hybernia	228
pflugiana, Ehippiphora	223	promissa, Catocala	228
pharte, Erebia	44, 232, 270	promutata, <i>see</i> marginepunctata,	
phegea, Syntomis	285	Acidalia	
pheretes, Polyommatus 43, 44, 92,	233, 269	pronuba, Triphæna 61, 91, 209, 252	
phicomone, Colias 43, 198, 200,	232, 233, 270	pronubana, Tortrix 75, 93, 146,	220, 268
phlæas, Rumicia (Chrysophanus) 41,		prosapiaria (fasciaria), Elloppia 193,	307
96, 104, 152, 156, 164, 166,		protea, Hadenia	61, 91, 100
171, 174, 222, 223, 231, 243, 284		pruinata (cytisaria), Pseudopteryna	
phæbe, Melitea 150, 155, 158, 174,		161, 174, 285	
197, 198, 202, 222, 228, 246,	283	prunaria, Angerona 63, 231, 267,	
phragmitellus, Chilo	206, 220	295, 297, 304, 306, 307	
phragmitidis, Calamia	58	prunata, Cidaria	64
picata, Cidaria 64, 208, 239, 264,	295, 304	pruni, Strymon (Thecla) 49, 75,	
pictaria, Aleucis	148, 290	88, 104, 123, 147, 166, 187,	188, 221, 284
pilosaria, Phigalia	124	pseudargiolus, Celastrina	243
pilosella, Oxyptilus	175, 271	pseudonomion <i>var.</i> (apollo), Par-	
pinastri, Hyloicus (Sphinx)	291	nassius	104, 131
pinellus, Crambus	208	pseudospetrella, Borkhausenina	267
pinguinella, Gelechia	52	psi, Triæna (Acronycta) 61, 91, 188,	224
pinaria, Chleuastus (Bupalus) 162,	208	psodea <i>var.</i> (medusa), Erebia 282,	284
piniperda, Trachea	91, 196	Psodos	201
pirata <i>ab.</i> (briseis), Hipparchia	157	pterodactyla, Stenoptilia 189, 198,	231, 271
psi, Hadenia	224	pudibunda, Dasychira	61, 267
pistacina, Anchocelis 62, 91, 250,	251	pulchellata, Eupithecia	64, 100
pityata <i>ab.</i> (asperaria), Rhoetria	162	pulchrina, Plusia	62
plagiata, Anaitis	64, 124, 285	pulla, Epichnopteryx	189
plecta, Noctua	61, 91, 163, 215	pullata, Gnophos	100
plexippus, Anosia	303	pulveraria, Numeria	63
plumaria, Selidosema	208	pulverulenta (cruda), Tæniocampa	52
plumularia, Anthometra	162	pumilata, Eupithecia	124
pluto <i>var.</i> (glacialis), Erebia	201	punctalis, Stenina	206
podalirius, Papilio 64, 73, 89, 130,	151, 156	punctaria, Ephyra (Zonosoma) 63,	267, 295
politata, Ptychopoda	161	punctata, Naclia	174
polychloros, Eugonia 41, 89, 93,		pupillaria, Cyclophora (Zonosoma) 162	
105, 106, 107, 111, 131, 150,		purpuralis (minos), Anthrocera	
158, 164, 192, 208, 264, 276, 283		100, 223, 261, 271	
polysperchon <i>var.</i> (argiades), Everes	88		
polyxena, Thais 100, 111, 246, 283			

PAGE.

<i>pusaria</i> , Cabera ..	63, 223, 236, 295
<i>pustulalis</i> , Agdistis ..	55
<i>pustulata</i> , Comibæna (Phorodesma)	206, 248, 278, 279, 280
<i>puta</i> , Agrotis ..	51, 91, 196, 305
<i>putrescens</i> , Leucania ..	306
<i>putris</i> , Axylia ..	163
<i>pygmæola</i> , Lithosia ..	151, 156
<i>pyraliata</i> , Cidaria ..	207
<i>pyralina</i> , Cosmia ..	76
<i>pyramidea</i> , Amphipyra	62, 91, 229, 230
<i>pyri</i> , Saturnia ..	244
<i>pyrina</i> , Zeuzera ..	215, 262
<i>quadra</i> , Ctenistis ..	290
<i>quadrifaria</i> , Psodos ..	100, 271
<i>quadrifasciaria</i> , Coremia ..	295
<i>quadripunctata</i> , Caradrina ..	91
<i>quercifolia</i> , Eutricha ..	124, 242
<i>quercinaria</i> , Eugonia ..	220, 236
<i>quercus</i> , Bithys ..	52, 67, 75, 147, 151, 158, 165, 166, 260, 283, 284
<i>quercus</i> , Lasiocampa	62, 212, 224, 230, 294, 305
<i>radiata</i> var. (lubricipeda), Spilosoma ..	209
<i>radiellus</i> , Crambus ..	201
<i>rapæ</i> , Pieris ..	41, 47, 65, 73, 89, 104, 111, 121, 124, 126, 143, 144, 155, 156, 163, 171, 198, 211, 212, 263, 268, 272, 283
<i>reclusa</i> (pigra), Clostera ..	292
<i>rectangulata</i> , Eupithecia ..	64
<i>renardii</i> ab. (anceps), Mamestra ..	147
<i>repandata</i> , Boarmia ..	63, 76, 100, 205, 212, 219, 229, 244, 306
<i>reticulata</i> , Neuria ..	205
<i>revayana</i> , Sarrothripa ..	62
<i>rhamni</i> , Gonepteryx ..	41, 89, 104, 111, 120, 121, 126, 143, 144, 148, 150, 155, 163, 189, 197, 198, 201, 202, 208, 216, 226, 230, 231, 261, 277, 283, 285, 302
<i>rhizolitha</i> , Xylina ..	62
<i>rhododactyla</i> , Eucnemidophorus ..	151
<i>Rhodostrophia</i> ..	162
<i>rhomboidaria</i> , Boarmia ..	63
<i>richardsoni</i> , Meessia ..	219
<i>ridens</i> , Asphalia ..	207
<i>ripæ</i> , Agrotis ..	306
<i>rivata</i> , Melanippe ..	207, 231
<i>robiginata</i> , Ptychopoda ..	161
<i>roboraria</i> , Boarmia ..	231
<i>robsoni</i> var. (chi), Polia ..	278
<i>robsoni</i> var. (nebulosa), Aplecta ..	306, 308
<i>rosina</i> subsp. (amaryllis), Heliconius ..	76
<i>rostralis</i> , Hypena ..	250
<i>rotundaria</i> ab. (pusaria), Cabera ..	236, 295
<i>roxelana</i> , Pararge ..	283, 284
<i>rubescens</i> ab. (didyma), Erebia ..	104
<i>rubi</i> , Callophrys (Thecla) ..	73, 75, 76, 88, 97, 104, 111, 147, 152, 153, 163, 164, 165, 187, 221, 284

PAGE.

<i>rubi</i> , Macrothylacia ..	220
<i>rubi</i> , Noctua ..	61, 205
<i>rubidata</i> , Anticlea ..	52, 207
<i>rubiginata</i> , Melanthia ..	64
<i>rubricata</i> , Acidalia ..	151, 156, 223, 241
<i>rubricollis</i> , Gnophria ..	209
<i>rubrobasalis</i> , Pinacopteryx ..	307
<i>rufa</i> , Cænobia ..	305
<i>rufa</i> var. (favicolor), Leucania ..	76
<i>rufina</i> , Anchocelis ..	124
<i>rufocinerea</i> , Elachista ..	212
<i>rumicis</i> , Pharetra (Acronycta) ..	52, 61, 91, 92
<i>rupicaprararia</i> , Hybernaria ..	63
<i>Ruralides</i> ..	97
<i>Ruralides</i> ..	95
<i>Ruralidi</i> ..	97
<i>Ruralinæ</i> ..	97
<i>rurea</i> , Xylophasia ..	61, 213, 224
<i>russata</i> , Cidaria ..	64
<i>russula</i> , see sanio, Diacrisia (Nemeophila) ..	174
<i>rusticata</i> , Acidalia ..	174
<i>rutilus</i> var. (dispar), Chrysophanus ..	90, 217, 245, 284
<i>sacraria</i> , Sterrha ..	211
<i>salicata</i> , Larentia ..	213, 306
<i>salicis</i> , Leucoma ..	207
<i>salicis</i> ab. (rumicis), Acronycta ..	92
<i>sambucaria</i> , Urapteryx ..	63, 215, 266
<i>sanctæhelenæ</i> , Agdistis ..	55
<i>sanguinalis</i> , Pyrausta ..	223
<i>sanguinaria</i> , Lythria ..	162
<i>sanio</i> (russula), Diacrisia ..	207, 212, 285
<i>sao</i> , Pyrgus (Powellia) ..	43, 88, 130, 174, 198, 202, 223
<i>sarpedon</i> , Anthrocera ..	175
<i>sartorii</i> ab. (menyanthis), Acronycta ..	91
<i>satanas</i> , Agdistis ..	53
<i>satellitica</i> , Scopelosoma ..	62, 91
<i>saturnana</i> , Dichrorampha ..	75
<i>satyrion</i> , Cænonympha ..	44, 233
<i>saucia</i> , Peridroma (Agrotis) ..	51, 60, 250
<i>scabiosellus</i> , Nemotois ..	270
<i>scabriuscula</i> (pinastri), Dipterygia ..	90, 244
<i>schaufussi</i> hybr., Malacosoma ..	50
<i>scolieformis</i> , Egeria ..	48, 294
<i>scolopacina</i> , Xylophasia ..	220
<i>Scoparia</i> ..	207
<i>scutosa</i> , Heliothis ..	246, 284
<i>sebrus</i> , Cupido ..	199, 202
<i>secundaria</i> , Boarmia ..	122
<i>segetum</i> , Agrotis ..	91, 231, 250
<i>selasellus</i> , Crambus ..	206
<i>selene</i> , Brenthis ..	51, 89, 92, 224, 231, 232, 269, 271, 272, 273
<i>semele</i> , Hipparchia ..	23, 99, 105, 132, 151, 156, 206, 225, 284, 286
<i>semiargus</i> (acis), Cyaniris (Nomiades) ..	42, 44, 68, 88, 92, 105, 147, 151, 158, 164, 199, 201, 202, 233, 270, 271, 272, 284

	PAGE.		PAGE.
semibrunnea, <i>Xylina</i>	304	subornatella, <i>Phycis</i>	206
separata <i>ab.</i> (calabra), <i>Rhodo-</i>		subradiata <i>ab.</i> (eumedon), <i>Aricia</i> ..	244
<i>strophia</i>	162	subsericeata, <i>Acidalia</i>	22, 64
septodactyla (leinigianus), <i>Oven-</i>		subtristata, <i>Melanippe</i>	64
<i>denia</i>	231	subtusa, <i>Tethea</i>	62
serena, <i>Hecatera</i>	91, 207, 231	subumbrata, <i>Eupithecia</i>	231
sericealis, <i>Rivula</i>	63, 205, 206	subviolacea <i>ab.</i> (grossulariata),	
sericeata, <i>Sterrrha</i>	161	<i>Abraxas</i>	83, 295
serina <i>ab.</i> (pistacina), <i>Anchocelis</i>	250	succenturiata, <i>Eupithecia</i>	23, 24
sexalisata, <i>Lobophora</i>	292	suffumata, <i>Cidaria</i>	64
sibirica <i>ab.</i> (apollo), <i>Parnassius</i> ..	131	suffusa, <i>Peridroma</i>	91
sibylla, <i>Limenitis</i> 44, 45, 52, 89,		suffusa <i>ab.</i> (crategi), <i>Aporia</i> ..	89
93, 104, 105, 158, 207, 208,		suffusa <i>ab.</i> (phlæas), <i>Rumicia</i>	104
269, 282, 283		suffusa <i>ab.</i> (sylvata), <i>Abraxas</i> ..	21
sicula, <i>see</i> harpagula, <i>Drepana</i>		suhrianna <i>ab.</i> (rumicis), <i>Acronycta</i>	92
silaceata, <i>Cidaria</i>	64	sulphuralis, <i>see</i> trabealis, <i>Agrophila</i>	
similis (auriflua), <i>Porthesia</i> 90,	230	suwarovius <i>var.</i> (japygia), <i>Melan-</i>	
sinapis, <i>Leptidia</i> 89, 92, 104, 150,		<i>argia</i>	245, 246, 284
155, 202, 223, 226, 283, 301		swammerdammella, <i>Nemophora</i> ..	212
sinuella, <i>Homœosoma</i>	223	sylvanus, <i>Augiades</i> (<i>Hesperia</i>) 41,	
smaragdaria, <i>Phorodesma</i> 267,		89, 105, 151, 164, 189,	284
278, 279, 280		sylvata (ulmata), <i>Abraxas</i> 21, 63,	
sociella, <i>Aphomia</i>	207	220, 244	
solitariella, <i>Coleophora</i>	39	sylvata, <i>Asthena</i>	64
solutella, <i>Gelechia</i>	267	sylvinus, <i>Hepialus</i>	60, 286
sordidata (elutata), <i>Hypsipetes</i> 64,		sylvius, <i>Cyclopides</i>	265
306, 307		syngrapha <i>ab.</i> (corydon), <i>Agriades</i>	
spadicea, <i>Orrhodia</i>	62	244, 268, 285, 306	
sparganii, <i>Nonagria</i>	76	syringaria, <i>Pericallia</i>	63
spartiata, <i>Chesias</i>	52, 64, 162	tabaniformis (asiliformis), <i>Ægeria</i>	
sphegiformis, <i>Ægeria</i> 186, 187,	294	(<i>Sciapteron</i>) 48, 82, 83	
Sphingidæ	54	tages, <i>Nisoniades</i> 42, 89, 144, 151,	
sphinx, <i>Agdistis</i>	53, 54	155, 158, 212, 223, 231,	305
spilodactyla, <i>see</i> migadactyla,		tamaricis, <i>Agdistis</i>	54, 55
<i>Wheeleria</i>		taras <i>ab.</i> (malvæ), <i>Hesperia</i> ..	187
spini, <i>Klugia</i> (<i>Thecla</i>) 198, 202,		taraxaci, <i>Caradrina</i>	205
246, 284		tarsipennalis, <i>Herminia</i>	63
spinula, <i>see</i> glaucata, <i>Cilix</i>		telicanus, <i>Langia</i>	211, 262, 263
sponsa, <i>Catocala</i>	156, 228	temerata, <i>Bapta</i>	63
stabilis, <i>Tæniocampa</i> 61, 91,	147	tenebrata, <i>Heliaca</i>	91
stagnata, <i>Hydrocampa</i>	208	tenebrosa, <i>Rusina</i>	91, 231
statices, <i>Adscita</i>	273, 285	tephradactylus, <i>Leioptilus</i> ..	100, 122
staticis, <i>Agdistis</i>	53, 54	testacea, <i>Luperina</i>	61, 91
statilinus, <i>Hipparchia</i> 154, 155,		testata, <i>Cidaria</i>	64
157, 222		testudo, <i>Cochlidion</i>	283
stellatarum, <i>Sesia</i>	111, 284	tetradactyla, <i>see</i> tridactyla, <i>Merri-</i>	
Stenoptilia	201	<i>fieldia</i>	
straminata, <i>Ptychopoda</i> (<i>Acidalia</i>)		thalassina, <i>Hadena</i>	61, 213, 224
162, 207, 228		Thalera	248
straminea, <i>Leucania</i> 205, 230,		thaumas, <i>see</i> flava, <i>Adopæa</i>	
290, 291		theivora, <i>Helopeltis</i>	218
strataria, <i>Amphidasys</i>	212	theophrastus, <i>Catochrysops</i> ..	211
striata <i>ab.</i> (bellargus), <i>Agriades</i> ..	187	thersamon, <i>Chrysophanus</i> 245,	284
strigata, <i>see</i> æstivaria, <i>Hemithea</i>		thiemensis <i>var.</i> (flavofasciata),	
<i>strigilis</i> , <i>Miana</i>	91	<i>Erebia</i>	45
strigula, <i>Agrotis</i>	91	thore, <i>Brenthis</i>	42, 43, 271
stygne, <i>Erebia</i> 43, 89, 92, 157, 269,	271	thrasonella, <i>Glyphipteryx</i> ..	219
suasa, <i>Hadena</i>	230, 231	thymiaria, <i>see</i> æstivaria, <i>Hemithea</i>	
suavella, <i>Rhodophæa</i>	205, 231	thysides <i>var.</i> (pamphilus), <i>Cæno-</i>	
subalpina <i>ab.</i> (dorilis), <i>Loweia</i> 200,	271	<i>nympha</i>	67
subcapucina <i>var.</i> (cristana), <i>Peronea</i>	100	tiliæ, <i>Mimas</i>	215, 244, 297
subfulvata, <i>Eupithecia</i> .. 23, 24,	64	tiliaria, <i>Ennomos</i>	292
subhastata <i>var.</i> (hastata), <i>Rheu-</i>		Tineina	189, 256
<i>maptera</i>	162	tithonus, <i>Epinephele</i> 42, 105, 150,	297
sublustris, <i>Xylophasia</i>	205	151, 155, 163, 174, 226, 244,	302

	PAGE.
<i>Tortrices</i>	75, 189
<i>torva</i> , <i>Notodonta</i>	166
<i>trabealis</i> (<i>sulphuralis</i>), <i>Agrophila</i>	151, 156, 284
<i>tragopogonis</i> , <i>Amphipyra</i> ..	62, 91
<i>transalpina</i> , <i>Anthrocera</i> 175, 202,	261
<i>trapezina</i> , <i>Calymnia</i> (<i>Cosmia</i>) 91,	62, 229
<i>tremulæ</i> <i>var.</i> (<i>populi</i>), <i>Limenitis</i>	43, 104, 283, 307
<i>triangulum</i> , <i>Noctua</i>	91
<i>tridactyla</i> (<i>tetractyla</i>), <i>Merrifieldia</i>	151, 189
<i>tridens</i> , <i>Triæna</i> (<i>Acronycta</i>) ..	188
<i>trifolii</i> , <i>Anthrocera</i> ..	60, 243, 294
<i>trifolii-major</i> , <i>Anthrocera</i> ..	243
<i>trigeminana</i> , <i>Epiblema</i> ..	217
<i>trigrammica</i> (<i>trilinea</i>), <i>Grammesia</i>	62, 91, 213, 231, 243
<i>trilinea</i> , <i>see</i> <i>trigrammica</i> , <i>Grammesia</i>	
<i>trilinearia</i> , <i>Ephyra</i>	63
<i>triopes</i> <i>var.</i> (<i>gorge</i>), <i>Erebia</i> 43, 44	
<i>triops</i> <i>var.</i> (<i>mæra</i>), <i>Pararge</i> ..	100
<i>triplasia</i> , <i>Habrostola</i>	62
<i>tristata</i> , <i>Melanippe</i> ..	270, 271
<i>tristellus</i> , <i>Crambus</i>	226
<i>trivia</i> , <i>Melitæa</i> ..	245, 246, 283
<i>truncicolella</i> , <i>Scoparia</i>	224
<i>tumidella</i> , <i>Phycis</i>	229
<i>turca</i> , <i>Leucania</i>	207, 305
<i>tuttodactyla</i> <i>var.</i> (<i>faunus</i>), <i>Marasmarcha</i> ..	158, 174, 203
<i>tyndarus</i> , <i>Erebia</i> 44, 157, 198, 201,	233, 271
<i>typhæ</i> , <i>Nonagria</i>	2, 52, 76
<i>typhon</i> , <i>Cænonympha</i>	42, 225
<i>typica</i> , <i>Nænia</i>	23, 47, 48
<i>uhagoni</i> <i>ab.</i> (<i>prieuri</i>), <i>Hipparchia</i> 157	
<i>ulicetana</i> , <i>Catoptria</i>	223
<i>ulmata</i> , <i>see</i> <i>sylvata</i> , <i>Abraxas</i>	
<i>ulvæ</i> , <i>Senta</i>	76, 289, 290, 291
<i>umbra</i> , <i>Chariclea</i>	306
<i>umbratica</i> , <i>Cucullia</i>	62
<i>unangulata</i> , <i>Melanippe</i>	64
<i>unanimis</i> , <i>Apamea</i>	224
<i>unidentaria</i> , <i>Coremia</i>	64
<i>unicolor</i> <i>ab.</i> (<i>neustria</i>), <i>Malacosoma</i> 98	
<i>unicolor</i> <i>ab.</i> (<i>pamphilus</i>), <i>Cænonympha</i>	42
<i>unicolor</i> <i>var.</i> (<i>satyrion</i>), <i>Cænonympha</i>	44
<i>unicolor</i> (<i>xerampelina</i>), <i>Cirrhwædia</i> 296	
<i>unifasciata</i> , <i>Emmelesia</i>	207
<i>unipuncta</i> (<i>extranea</i>), <i>Leucania</i> ..	303
<i>upsilon</i> , <i>Orthosia</i>	243
<i>urticæ</i> , <i>Aglais</i> (<i>Vanessa</i>) 41, 52,	60, 89, 105, 106, 107, 111, 120, 121, 125, 126, 145, 153, 164, 197, 198, 199, 201, 202, 225, 226, 244, 268, 272, 285, 305, 307
<i>urticæ</i> , <i>Habrostola</i>	62
<i>urticæ</i> , <i>Spilosoma</i>	292, 306
<i>vaccinii</i> , <i>Orrhodia</i> (<i>Cerastis</i>) 62, 91	

	PAGE.
<i>valezina</i> <i>var.</i> (<i>paphia</i>), <i>Dryas</i>	
(<i>Argynnis</i>)	208, 243
<i>Vanessidæ</i>	106
<i>varia</i> <i>var.</i> (<i>parthenie</i>), <i>Melitæa</i> 43, 225	
<i>variata</i> , <i>Thera</i>	52
<i>varleyata</i> <i>ab.</i> (<i>grossulariata</i>),	
<i>Abraxas</i>	296, 304
<i>velleda</i> , <i>Hepialus</i>	223
<i>venosata</i> , <i>Eupithecia</i> 100, 212,	213, 231
<i>verbascalis</i> , <i>Ebulea</i>	231
<i>verbasci</i> , <i>Cucullia</i>	230, 244
<i>vernaria</i> , <i>Geometra</i>	97
<i>versicolora</i> , <i>Dimorpha</i> 121, 147, 264	
<i>verticalis</i> , <i>Botys</i>	208
<i>vespiformis</i> , <i>Trochilium</i>	219
<i>vetusta</i> , <i>Xylocampa</i>	220
<i>vibicaria</i> , <i>Rhodostrophia</i>	162
<i>vidua</i> <i>ab.</i> (<i>hyperanthus</i>), <i>Enodia</i>	
(<i>Aphantopus</i>)	131
<i>villica</i> , <i>Arctia</i> 207, 219, 231, 267, 294	
<i>vinculella</i> (<i>richardsoni</i>), <i>Meessia</i> ..	219
<i>vinula</i> , <i>Cerura</i> 47, 61, 189, 207,	215, 231
<i>violacea</i> <i>var.</i> (<i>æthiops</i>), <i>Erebia</i> ..	132
<i>viretata</i> , <i>Lobophora</i>	212, 306
<i>virgata</i> <i>ab.</i> (<i>adippe</i>), <i>Argynnis</i> ..	44
<i>virgata</i> <i>ab.</i> (<i>ashworthii</i>), <i>Agrotis</i> ..	307
<i>virgata</i> , <i>Mesotype</i>	206
<i>virgaureæ</i> , <i>Heodes</i> (<i>Chrysophanus</i>)	156, 158, 174, 193, 198, 271
<i>virgaureata</i> , <i>Eupithecia</i>	22, 74
<i>viridana</i> , <i>Tortrix</i>	189
<i>viridaria</i> (<i>pectinataria</i>), <i>Larentia</i>	64, 223
<i>viridata</i> , <i>Nemoria</i> 100, 210, 220, 295	
<i>viridella</i> , <i>Adela</i>	212
<i>vitalbata</i> , <i>Phibalapteryx</i>	174, 231
<i>vitellina</i> , <i>Leucania</i>	306
<i>vulgata</i> , <i>Eupithecia</i>	64, 212
<i>w-album</i> , <i>Edwardsia</i> (<i>Strymon</i> , <i>Thecla</i>) 75, 76, 89, 104, 123, 130, 147, 164, 166, 197, 213, 214, 230	
<i>w-latinum</i> <i>ab.</i> (<i>dissimilis</i>), <i>Hadena</i> 303	
<i>wolfensbergeri</i> <i>var.</i> (<i>maturna</i>),	
<i>Melitæa</i>	43, 44
<i>xanthodactyla</i> , <i>Wheeleria</i> ..	151, 174
<i>xanthographa</i> , <i>Noctua</i> 91, 212, 229, 290	
<i>xanthomelas</i> , <i>Eugonia</i> (<i>Vanessa</i>) ..	283
<i>xanthomista</i> , <i>Polia</i>	22, 268, 305
<i>xerampelina</i> , <i>Cirrhwædia</i> ..	268, 296
<i>Xylina</i>	62
<i>zatina</i> <i>var.</i> (<i>lubricipeda</i>), <i>Spilosoma</i>	267, 294
<i>ziczac</i> , <i>Notodonta</i>	207, 292
<i>zinckenii</i> , <i>Xylina</i>	265

MYRIAPODA.

<i>guttulatus</i> , <i>Blanajulus</i>	256
---------------------------------------------	-----

NEUROPTERA.

<i>coccajus</i> , <i>Ascalaphus</i>	175
-------------------------------------------	-----

	PAGE.		PAGE.
ODONATA.		discrepans, Rhacocleis	38
sanguineum, Sympetrum	268	Drymadusa	160
ORTHOPTERA.		edentula, Chelidoura	219
Abrosoma	128	Ephippigera	238
affinis, Platycleis	138, 140	ephippigera, Ephippigera	298
Aglaothorax	160	Ephippigeridæ	237
albifrons, Decticus	170, 171, 129	Eurycantha	129
albipennis, Apterygida	252, 254, 268	fallax, Olynthoscelis	117, 118, 219
alpinus, Anonconotus	20	femoratus, Olynthoscelis	117, 119
Anabrus	160	fletcheri, Platycleis	160
Anareolata	129	florezi, Antaxius	69
Anisomorpha	128	Gampsocleis	19
annulatus, Rhacocleis	39	glabra, Gampsocleis	20
Anonconotus	19, 20	gracilis, Pachytrachelus	117
Anoplodura	160	grallatus, Scirtobænus	38
Antaxius	19, 68	grisea, Platycleis	138, 141, 252
Anterastes	19, 116	gristo-aptera, Olynthocelis	117
apenninigenus, Anonconotus	20	Heteropteryx	129
apfelbecki, Chelidoura	219	hispanicus, Antaxius	69, 70
apterus, Olynthoscelis	117, 118	hispanica, Ephippigera	239, 300
areolaria, Ephippigera	239, 301	hormanni, Platycleis	219
Areolata	129, 130	incerta, Platycleis	138, 141
Asprenas	129	inflatus, Callimenus	242
assoi, Gampsocleis glabra var. ..	21	intermedia, Platycleis	130, 139
auricularia, Forficula	266	jugicola var. (cunii), Ephippigera ..	299
austriacus, Olynthoscelis	118	kraussi, Antaxius	69, 70
azami, Platycleis	170	laticauda, Platycleis	138, 139
Bacunculini	129	lesnei, Forficula	252, 253
Bætica	238	lineatus, Stenobothrus	252, 253
bætica, Amphiestris	18	lineolatus, Nemobius	219
bicolor, Platycleis	138, 160, 167	Lonchodini	129
bicolor, Stauroderus	253	longicauda, Ephippigera	239, 300
bidens, Thyreonotus	68	longicollis, Callimenus	242
biguttulus, Stauroderus	219	lusitanicus, Scirtobænus	38
bitterensis, Ephippigera	239	maculata, Aphlebia	219
bolivari, Ctenodecticus	115, 116	marmorata, Platycleis	139, 169
bormansi, Ephippigera	239, 300	marqueti, Platycleis	139, 169
bormansi, Rhacocleis	39	masferrerii, Ctenodecticus	115, 116
brachyptera, Platycleis	138, 167	minor var. (terrestris), Ephippigera ..	299
brauneri, Callimenus	242	minor var. (spoliata), Pterolepis ..	37
brevipennis, Platycleis	169	modesta, Platycleis	219
brunneri, Olynthoscelis	117, 118	Monandroptera	129
brunneri, Antaxius	79, 71	montana, Platycleis	138, 142
buyssoni, Platycleis	139, 169	montandoni, Callimenus	232
Callicrania	238	montanus var. (corsicus), Thyreo-	
Callimenus	242	notus	68
capellei, Antaxius	69, 71	montpelliensis var. (albifrons),	
Capnobates	160	Decticus	171
carinata, Ephippigera	239, 301	Necrosiidae	129
carpetana, Platycleis	138, 142	Neduba	160
chabrieri, Olynthocelis	117, 118	neglectus, Rhacocleis	39
cineurus, Thamnotrizon	252, 307	Neobarrettia	160
Clitumni	129	nigromarginata var. (dorsalis),	
cordubensis, Pterolepis	37	Ephippigera	300
corsicus, Thyreonotus	68	nigrosignata, Platycleis	138, 140
crucigera, Ephippigera	239, 289	obtusa, Isophya	219
Ctenodecticus	19, 115	Olynthoscelis	19, 117, 160
cunii, Ephippigera	239, 299	oporina, Platycleis	138, 168
decorata, Platycleis	138, 167	orsinii, Chelidoura	219
Decticiidae	18, 159, 193	Pachytrachelus	116, 119
Decticus	19, 160, 170	Palophus	128
diluta, Ephippigera	239, 301	pancei, Callimenus	242
		pantingana, Ephippigera	239, 301
		parallelus, Chorthippus	253
		paulinoi, Ephippigera	239, 301

	PAGE.
pedestris, Antaxius.. ..	69, 70
perforata, Ephippigera ..	237, 299
Phasmidæ	128
Phyllium	128
Platycleis 19,	137, 160, 219
Platystolus	238
Præehippigera	228
provincialis, Ephippigera ..	239, 298
Pterolepis	19, 37
punctatissima, Leptophyes	252, 254
pupulus, Ctenodecticus ..	115, 116
Pycnogaster	238
raymondi, Anterastes	116
Rehnia	160
reiseri, Chelidoura	219
Rhacocleis	19, 38, 160
Rhaphiderus	129
riparia, Labidura	266
roeselii, Platycleis	139, 219, 268
rufus, Gomphocerus	252
sabulosa, Platycleis	138, 139
saussureana, Ephippigera ..	239, 301
saussureana, Platycleis ..	138, 167
scabricollis, Peranabrus ..	160
Scirtobænus	19, 38
sepium, Platycleis.. ..	138, 141, 160
silvicola, Ephippigera vitium var.	298
sorrenzensis, Antaxius	69, 70
spinibrachius, Antaxius	69
spoliata, Pterolepis.. ..	37
Steropleurus.. ..	238
Stipator	160

	PAGE.
stricta, Platycleis	138, 141
striolatus, Pachytrachelus..	117
sylvestris (intermedia), Platycleis	138, 167
terrestris, Ephippigera	239, 299
tesselata, Platycleis	138, 140
Thyreonotus	19, 68
transsylvanicus, Olynthoscelis	219
Uromenus	238
varium, Meconema	253
verrucivorus, Decticus	170, 253, 254, 268
viridissima, Locusta	252, 253
viridulus, Omocestus	253
vitium, Ephippigera	239, 298
vittata, Platycleis	138, 140
zapateri, Ephippigera	239, 298, 300

PSEUDOSCORPIONES.

maritimum, Obisium	71
muscorum, Obisium	71
Pseudoscorpiones	255
scorpioides, Chermes	255

SIPHONAPTERA.

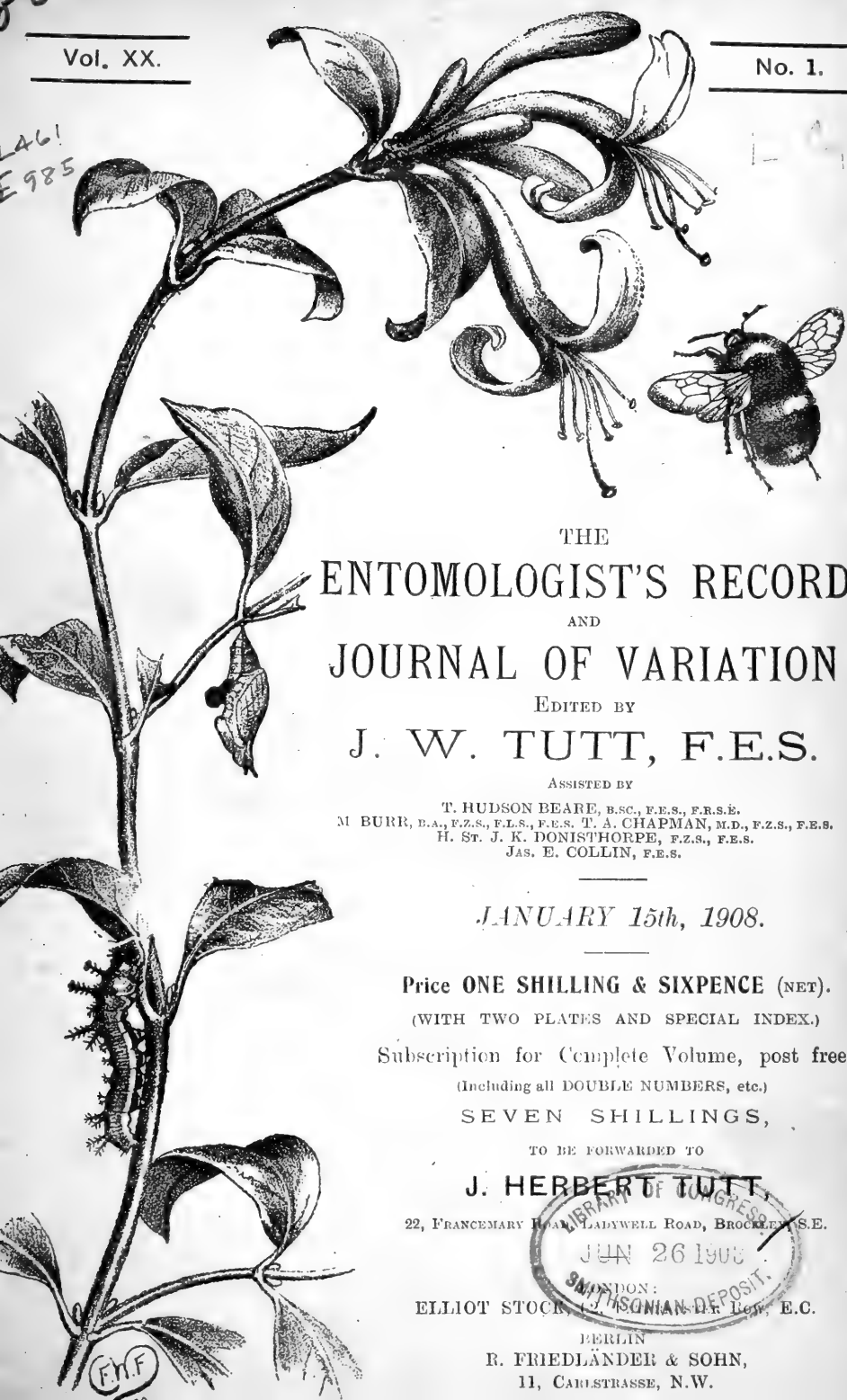
borealis, Ceratophyllus	28
isacanthus, Typhlopsylla	51
talpæ, Hystrichopsylla	124



Vol. XX.

No. 1.

46!
E 985



THE
ENTOMOLOGIST'S RECORD
AND
JOURNAL OF VARIATION
EDITED BY
J. W. TUTT, F.E.S.

ASSISTED BY

T. HUDSON BEARE, B.Sc., F.E.S., F.R.S.E.
M. BURR, B.A., F.Z.S., F.L.S., F.E.S. T. A. CHAPMAN, M.D., F.Z.S., F.E.S.
H. ST. J. K. DONISTHORPE, F.Z.S., F.E.S.
JAS. E. COLLIN, F.E.S.

JANUARY 15th, 1908.

Price ONE SHILLING & SIXPENCE (NET).

(WITH TWO PLATES AND SPECIAL INDEX.)

Subscription for Complete Volume, post free

(Including all DOUBLE NUMBERS, etc.)

SEVEN SHILLINGS,

TO BE FORWARDED TO

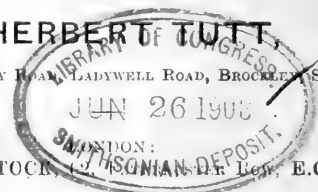
J. HERBERT TUTT

22, FRANCIS ROAD, LADYWELL ROAD, BROOKLYN, N.E.

ELLIOT STOCK, 15, PATERNOSTER ROW, E.C.

BERLIN

R. FRIEDLÄNDER & SOHN,
11, CARLSTRASSE, N.W.



(F.H.F.)

GRESHAM LIFE OFFICE.

Founded 1848.

Assets, £9,500,000.

NEW FEATURE.

Endowment Assurance Policy,
WITH CESSATION OF PREMIUMS
DURING INCAPACITY
(Temporary or Permanent.)

VERY MODERATE PREMIUMS.

Head Office—ST. MILDRED'S HOUSE, POULTRY, LONDON, E.C.

JAMES H. SCOTT, *General Manager and Secretary.*

THE GRESHAM LIFE ASSURANCE SOCIETY, LIMITED.

D. F. TAYLER & Co., Ltd., **Entomological Pin Manufacturers,**

SMALL HEADS AND PERFECT POINTS. WHITE, BLACK, AND GILT.

BIRMINGHAM and LONDON.

Can be obtained from Dealers throughout the World.

NEW FOREST BUTTERFLIES & MOTHS

Ova, Larvæ, Pupæ, and (bred) Imagines supplied to order by

G. TATE and SON,
Entomologists, Lyndhurst, New Forest.

Established 1870.

Instructions given in Practical Entomology. Correspondence invited.

LABELS ! LABELS !! LABELS !!!

It is very essential that every specimen, to be authentic, should bear a minute label, giving locality, date of capture, and name of captor.

3000

{ To comprise equal numbers of not more than ten localities.
Larger quantities *pro rata*. Orders executed in same order as
received. Remittance in full must accompany each order. }

5/-

Rannoch
16. vi. 97

New Forest
4. ix. 97

Shetland
5. v. 97

ADDRESS.—“Requisites,” Coombe Lodge, Mycenæ Road,
Westcombe Park, S.E.

Breeding Nets.

Wire frame bow-shaped nets, to slip on 5-inch and 8-inch flower-pots or saucers, open both ends. Useful for rearing larvæ on growing plants. Fold flat when not in use. 10in. by 9in., 9d.; 15in. by 12in., 1s. 6d. Also light pocket lamp-post nets, 2s., carriage paid.

S. W. GADGE, 68, Chestnut Grove, Balham.

WATKINS & DONCASTER,

Naturalists and Manufacturers of Entomological Apparatus and Cabinets.

Plain Ring Nets, wire or cane, including Stick, 1/3, 2/-, 2/6. Folding Nets, 3/6, 4/-. Umbrella Nets (self-acting), 7/-. Pocket Boxes, 6d., 9d., 1/-, 1/6. Zinc Relaxing Boxes, 9d., 1/-, 1/6, 2/-. Nested Chip Boxes, 7d. per four dozen. Entomological Pins, assorted or mixed, 1/-, 1/6 per ounce. Pocket Lanterns, 2/6 to 8/-. Sugaring Tin, with brush, 1/6, 2/-. Sugaring Mixture, ready for use, 1/9 per tin. Store-Boxes, with camphor cells, 2/6, 4/-, 5/-, 6/-. Setting-Boards, flat or oval, 1in., 6d.; 1½in., 8d.; 2in., 10d.; 2½in., 1/-; 3½in., 1/4; 4in., 1/6; 5in., 1/10; Complete Set of fourteen Boards, 10/6. Setting Houses, 9/6, 11/6; corked back, 14/-. Zinc Larva Boxes, 9d., 1/-, 1/6. Breeding Cage, 2/6, 4/-, 5/-, 7/6. Coleopterist's Collecting Bottle, with tube, 1/6, 1/8. Botanical Cases, japanned, double tin, 1/6 to 4/6. Botanical Paper, 1/1, 1/4, 1/9, 2/2 per quire. Insect Glazed Cases, 2/6 to 11/-. Cement for replacing Antennæ 4d. per bottle. Steel Forceps, 1/6, 2/-, 2/6 per pair. Cabinet Cork, 7 by 3½, best quality 1/6 per dozen sheets. Brass Chloroform Bottle, 2/6. Insect Lens, 1/- to 8/-. Glass-top and Glass-bottomed Boxes, from 1/- per dozen. Zinc Killing Box, 9d. to 1/-. Pupa Digger, in leather sheath, 1/9. Taxidermist's Companion, containing most necessary implements for skinning, 10/6. Scalpels, 1/3; Scissors, 2/- per pair; Eggdrills, 2d., 3d., 9d.; Blowpipes, 4d.; Artificial Eyes for Birds and Animals; Label-lists of British Butterflies, 2d.; ditto of Birds' Eggs, 2d., 3d., 6d.; ditto of Land and Fresh-water Shells, 2d.; Useful Books on Insects, Eggs, etc.

THE WAND TELESCOPE NET (An innovation in Butterfly Nets).

We beg to call your attention to our new Telescopic Handle for butterfly nets. It is made entirely in brass, and is light and strong, and, moreover, it can be shut up to carry in small compass. A very compact pattern, effecting great saving in weight and bulk.

Prices—2 joints, 8/6; 3 joints, 9/6; 4 joints, 10/6.

Complete with cane folding ring and bag. We shall be pleased to send on application.

SHOW ROOM FOR CABINETS

Of every description of INSECTS, BIRDS' EGGS, COINS, MICROSCOPICAL OBJECTS, FOSSILS, &c.

Catalogue (100 pages) sent on application, post free.

LARGE STOCK OF INSECTS AND BIRDS' EGGS (British, European, and Exotic.)

Birds, Mammals, etc., Preserved and Mounted by First-class Workmen.

Only Address—**36, STRAND, LONDON, W.C.** (5 doors from Charing Cross)

OVA, LARVÆ, AND PUPÆ.

The Largest Breeder of Lepidoptera in the British Isles is

H. W. HEAD, Entomologist,
SCARBOROUGH.

Full List of Ova, Larvæ, and Pupæ, also Lepidoptera, Apparatus, Cabinets, etc., sent on application.

Many Rare British Species and Good Varieties for Sale.

Lantern Slides in Natural Colours.

LEPIDOPTERA & LARVÆ A SPECIALITY.

Photographed from life and true to Nature in every detail.

SLIDES OF BIRDS, WILD FLOWERS, &c.,

By same Colour Process.

LANTERN SLIDES MADE TO ORDER FROM ANY SPECIMEN OR COLOURED DRAWING.

**PHOTOS IN COLOUR OF LARVÆ, LIFE SIZE, ON IVORINE
TABLETS TO PIN IN THE CABINET.**

For List apply to—

CHARLES D. HEAD, 2, Mount Vernon, Dollymount, DUBLIN.

The Entomologist's Library.

By J. W. TUTT, F.E.S.

A Natural History of the British Lepidoptera, their world-wide variation and geographical distribution (*illustrated*).

(A text-book for Students and Collectors.)

Vols. I, II, III, IV, V and VIII, Price £1 each volume, net. Demy 8vo., thick, strongly bound in cloth. Complete set of 6 vols., 5 guineas net.

The most concise and thorough work on Lepidoptera ever offered to the entomological public.

A Natural History of the British Butterflies, their world-wide variation and geographical distribution (*illustrated*).

(A text-book for Students and Collectors.)

Vol. I. Price one guinea net. Vol. II in course of publication (Monthly parts, 1/-).

A detailed account of the biology and variation of each British species, and a consideration of the literature and classification of the Palearctic species.

A Natural History of the British Alucitides, their world-wide variation and geographical distribution.

(A text-book for Students and Collectors.)

Vol. I. Price one guinea net. (To be completed in two volumes.)

Full details of the life-history of every British species; full historical account of the group and its classification.

Migration and Dispersal of Insects. Demy 8vo. Price 5s. net.

A detailed account of the migration of the Aphides, Orthoptera, Odonata, Diptera, Coleoptera, Hymenoptera, and Lepidoptera.

Practical Hints for the Field Lepidopterist (*illustrated*).

Two parts, 6s. each net. A detailed set of some 3000 practical hints. Full information for collecting, preserving, and using the material for scientific purposes.

The British Noctuæ and their Varieties. Complete in 4 volumes. 28s. per set net. Demy 8vo., strongly bound in cloth. Full account of the typical and all known described forms, with original descriptions.

Melanism and Melanochroism in British Lepidoptera.

Demy 8vo., bound in cloth. Price 5s. A full account of all the facts known bearing on the subject, and a closely reasoned explanation of probable causes.

100 Practical Hints on the British Eupitheciids. Price 1s.

A series of hints on the method of finding and rearing eggs, larvæ, pupæ and imagines of the "pugs."

Monograph of the British Pterophorina. Demy 8vo., 161 pp.

Bound in Cloth. Price 5s. net. An account of every British species and its life-history—each described under a series of detailed headings.

Rambles in Alpine Valleys. Crown 8vo. Bound in Cloth. With map and photographs. Price 3s. 6d. net. A graphic account of the rambles of a naturalist on the Italian side of Mont Blanc.

Woodside, Burnside, Hillside, and Marsh. Crown 8vo. Bound in Cloth. 242 pp. and 103 woodcuts and full-page illustrations. Price 2s. 6d. net. Descriptive account of well-known natural history localities (botanical, entomological, geological, ornithological), including Cobham, Cliffe, Cuxton, the Western Highlands, &c.

Random Recollections of Woodland, Fen, and Hill. Crown 8vo. Bound in Cloth. Price 3s. net. A detailed account of the fauna and flora of some well-known British natural history localities—Wicken, Deal, Chattenden, the Medway marshes, Freshwater, &c.

To be obtained from J. H. TUTT, 22, Francemary Road, Ladywell Road, Brockley, S.E., to whom Cheques and Postal Orders should be sent.

A FRIENDLY RECOMMENDATION,

if you are feeling run down, or out of sorts, or suffer from a disordered state of the Liver, Kidneys, Stomach, or Bowels, would be to take a well-tryed remedy. It would not be kindness to ask you to risk an experimental one. BEECHAM'S PILLS have a world-wide reputation, and sell by millions of boxes every year, and are every day maintaining tens of thousands of people in perfect health. The advice of these people would be to

TAKE

BEECHAM'S PILLS

for Sick-Headache, Indigestion, Poorness of Blood, Constipation, Biliousness, and Debility of the Nervous System. They give very speedy results, and quickly correct the irregularities that are causing you so much pain and anxiety. BEECHAM'S PILLS are composed entirely of medicinal herbs, and are warranted free from mercury or other substances. They can harm no one, and may be given to children, or to the aged and infirm, with perfect safety. It will be to your interest to do as many others are doing with such great advantage to themselves. Begin to take BEECHAM'S PILLS at once.

Prepared only by THOMAS BEECHAM, St. Helens, Lancs.

Sold everywhere in boxes, price 1/1½ (56 pills) & 2/9 (168 pills.)

Subscriptions for Vol. XX (7 shillings) are now due, and should be sent without delay (and so save time and correspondence) to J. Herbert Tutt, 22, Francemary Road, Ladywell Road, Brockley, S.E. Will subscribers please oblige? [This subscription includes all numbers published from January 15th to December 15th, 1908.]

Non-receipt or errors in the sending of Subscribers' magazines should be notified to Mr. H. E. Page, "Bertrose," Gellatly Road, Hatcham, S.E.

NOTICE.

The Back Volumes (I-XIX) of *The Entomologist's Record*, &c., can be obtained at 10s. 6d. per Volume. Complete set of 18 vols. £6 13s. 6d. net. "Special Index" to Vols. III., IV., V., VI., VII., VIII., IX., X., XI., XII., XIII., XIV., XV., XVI., XVII., XVIII. and XIX., are sold separately, price 1/6 each. Single Back Numbers can be obtained at double the published price from 119, Westcombe Hill, Blackheath, S.E.

Subscribers are kindly requested to observe that subscriptions to *The Entomologist's Record*, &c., are payable in advance. The subscription (with or without the Special Index) is Seven Shillings, and must be sent to Mr. J. Herbert Tutt, 22, Francemary Road, Ladywell Road, Brockley, S.E. Cheques and Postal Orders should be made payable to J. W. Tutt.

ADVERTISEMENTS of Books and Insects for Sale will be inserted at a minimum charge of 2s. 6d. (for four lines). Longer Advertisements in proportion. A reduction made for a series. Particulars of Mr. J. Herbert Tutt, 22, Francemary Road, Ladywell Road, Brockley, S.E.

Subscribers who change their addresses must report the same to Mr. H. E. PAGE, "Bertrose," Gellatly Road, St. Catherine's Park, London, S.E., otherwise their magazines will probably be delayed, also to Mr. J. HERBERT TUTT, 22, Francemary Road, Ladywell Road, Brockley, S.E.

Articles for insertion and Exchanges should be sent to J. W. TUTT, Rayleigh Villa, Westcombe Hill, S.E., except notes relating to Coleoptera, which should be sent to Mr. H. DONISTHORPE, 58, Kensington Mansions, South Kensington, S.W., and of Orthoptera, to Mr. BURR, Sibertswood, near Dover.

Articles that require Illustration are inserted on condition that the author defrays the cost of the illustrations.

All Exchange Magazines must be forwarded to J. W. TUTT, Rayleigh Villa, Westcombe Hill, Blackheath, S.E.

EXCHANGES.—The use of this column for the offer of "Duplicates" and "Desiderata" and "Changes of address" is open free to subscribers personally so far as there is space available.

Duplicates.—Io, Urticæ, Sibylla, Semele, Adippe, Alveolus, Tages, Arion (fair), Argiolus ?, Alsus, W-album*, S. populi*, Revayana, Rubricollis (fair), Cristulalis (white pins), Aureola, Camelina, Carmelita (gilt pins), Dietæa, Batis, Flavicornis, Piniperda, Miniosa, Gothica, Brunnea, Baja, Rumicis, Rubricosa, Pistacina, Cytherea, Rufina, Neglecta, Tenebrosa, Vaccinii, Popularis, Oxyacanthæ, Aprilina, Saucia, Suffusa, Herbida, Stabilis, Libatrix, Rhizolitha, Umbratica, Chrysis, Petrificata (fair), Hirtaria, Rostralis, Cytisaria, Exanthemaria, Unidentata, Procellata, Dubitata, Lobulata, Trepidaria, Parthenias, Triplasia, Fontis, Ulmata, Centaureata, Consortaria, Advenaria, Palumbaria.—Percy M. Bright, Fairfield, Wimborne Road, Bournemouth.

Duplicates.—Smaragdaria*, Unifasciata* (black pins). *Desiderata*.—Numerous.—*F. Wallace*, 240, High Street, Stratford, E.

Duplicates.—Vars. of *Peronea cristana*, viz., Striana, Semiustana, Cristallana, Consimilana, Rufinigrana, Vittana, Desfontainana, Subunicolorana, Bentleyana, Insulana, Spadiceana, Sequana, Subcapucina, Substriana, Subfulvovittana, Subcristallana, Cristana. *Desiderata*.—Lafauriana, Comariana, Ochreana, Perplexana, Herbana, Fuligana, Woodiana, Communana, Abrasana, Chrysanthemana, Doubledayana, Wahlbomiana, Paludana.—*J. A. Clark*, 57, Weston Park, Crouch End, N.

Duplicates.—Pastinum (fair), Micacea, Lunosa, Saucia, Derasa, Puta, Testacea, N. rubi, Janthina, Morpheus, Testata, Umbratica, Plecta, Chrysitis, Iota, Camelina, C-nigrum, Tritici, Suffusa, Cerago, Popularis, Persicariae, Gilvago, Geryon, Verbasci, Fulva, Griseola, Graminis, Centaureata, Lanestris, Caniola. *Desiderata*.—Numerous. Lists exchanged.—*C. W. Williams*, Penarth.

Duplicates.—Elpenor, pupæ (few), *Potatoria, *Neustria, *Illunaria, *Pudibunda, Spadicea. *Desiderata*.—Athalia, Artaxerxes, Tincta, Advena, Atriplicis, Contigua, Vetusta, Exoleta, etc.—*L. Stafford*, Gold Croft, Caerleon, Mons.

Duplicates.—Ziczac*, Putris*, Gemina, Suffusa, Saucia, N. rubi, Rubricosa, Gracilis, Lunosa, Fulvago, Flavago, Nigrocincta (few fair), Nigra, Umbratica, Bidentata, Repandata, Bisetata, Virgularia, Exanthemata, Didymata, Multistrigaria, Albulata, Ruberata (worn), Galiata, Mercurella, Semifuscana, Conspersana, Vittella, Messaniella, Costosa, Nervosa, Arenella, Applana, and others. *Desiderata*.—Very many common insects to renew.—*Dr. Cassal*, Ballaugh, Isle of Man.

WANTED.—Good photographs or careful drawings of Aberrations, Gynandromorphs, etc., of any British "Blues," for reproduction in *The Natural History of the British Butterflies*. Also photos and good drawings of Aberrations and Gynandromorphs of other groups that may be used later as opportunity offers. [Specimens not necessarily British.] *J. W. Tutt*, 119, Westcombe Hill, Blackheath.

MEETINGS OF SOCIETIES.

Entomological Society of London.—11, Chandos Street, Cavendish Square, W., 8 p.m. Meetings—January 15th (Annual), February 5th.

The City of London Entomological and Natural History Society.—London Institution, Finsbury Circus, E.C.—The first and third Tuesdays in the month, at 7.30 p.m., except in July and August. January 21st, Paper—"Is Sexual Dimorphism affected by climatic conditions?" *Dr. G. G. Hodgson*. February 4th.

Toynbee Hall Natural History Society.—Held at Toynbee Hall, Commercial Street, E., Mondays, at 8 p.m.

The South London Entomological and Natural History Society, Hibernia Chambers, London Bridge.—The second and fourth Thursdays in each month, at 8 p.m.—January 23rd (Annual), at 7 p.m. February 13th.

North London Natural History Society, The Amherst Club, Amhurst Road, N. (No notices).

Lancashire and Cheshire Entomological Society.—Meetings at the Royal Institution, Liverpool, on the 3rd Monday in the month from October to April. Hon. Sec., *H. R. Sweeting*, 6, The Elms, Dingle, Liverpool.

Birmingham Entomological Society, at the rooms of the Birmingham Nat. Hist. and Philosophic Society, Avebury House, 55, Newball Street, at 8 p.m. January 20th, February 17th (Annual).

Winkler and Wagner,

Institute for Natural History and Librarians for the Natural Sciences,

Vienna, XVIII, Dittesgasse, no. 11,

Recommend to Entomologists their

Excellent and perfectly made articles for the use of Entomologists.

Purveyors to Museums and Scientific Institutes throughout the world. Libraries of Entomological Books a speciality.

Recently we published our Lists, No. 5 (Coleoptera) and No. 6 (Lepidoptera). These, as well as an extract from our main Catalogue No. 7 (offering a selection of the most modern Entomological Apparatus, as well as novelties), will be sent free of charge on application.

Purchase of Single Entomological Works and Complete Libraries at the best possible prices.

Palaearctic Coleoptera and Lepidoptera, of the first quality, from 50 to 60 (two-thirds) per cent. off most catalogue prices. Lists of these free on application.

EXCHANGE OFFERS DESIRED.

Practical Hints for the Field Lepidopterist.

By J. W. TUTT, F.E.S.

TWO PARTS

(interleaved for Collector's own notes),

Containing about 3000 Practical Hints of the form so well known.

Together with

GENERAL & SPECIFIC INDEX,

Containing references to nearly 1600 British species,

By H. J. TURNER, F.E.S.

Together with Chapters on the

Preservation, Mounting, and Photographing of Eggs,

By F. NOAD CLARK and A. E. TONGE.

And also Chapters on

Collections, Collecting, Collectors, The Egg & Eggstage, the Larva & Larval Stage, the Pupa & Pupal Stage

(with model descriptions and hints for useful records), the whole illustrated by

SEVEN CAREFULLY EXECUTED PLATES.

Making this the most important book on the subject ever offered to the field lepidopterist.

PRICE—SIX SHILLINGS EACH PART (not interleaved).

(An Encyclopædia of Field Lepidopterology.)

The Butterfly Book of 1907.

A Natural History of the British Butterflies

THEIR WORLD-WIDE VARIATION AND GEOGRAPHICAL DISTRIBUTION.

By J. W. TUTT, F.E.S.

The second volume of the above standard work, fully and profusely illustrated, will be published as far as possible during the current year. In order to enable every lepidopterist to obtain this desirable reference work, it is being published in 20 monthly parts at 1s. per part.

The new parts deal with the "Hairstreaks" and the "Blues," will be of the same exhaustive and comprehensive character as the parts already completed, and will similarly form a large volume to be later published separately at 21s. net. The "Hairstreaks" are completed in 12 parts.

The attention of those interested in British Butterflies is directed to this standard work. The present volume, so far, deals with the complete life-histories, now worked out for the first time, of all our British "Hairstreaks," and is illustrated by the unequalled life-history photographs of Messrs. A. E. Tonge and H. Main, and the Photo-Micrographs of Messrs. F. Noad Clark and A. E. Tonge. Everyone ought to see this work and its illustrations. Parts I-XV, price 1/- each. Parts XIII and XIV contain plates showing full life-histories of *w-album*, *pruni*, *betulae*, and *quercus*—egg, larva, pupa, imago from nature.

To ensure delivery as soon as published, subscriptions should be sent direct, and the following (or a similar) covering note forwarded therewith.

Parts I, II, III, IV, V, VI, VII, VIII, IX, X, XI, XII, XIII, XIV, and XV can now be sent; XVI is in hand. Price 1s. each.

Please enter my name as a subscriber for copies of the new series of 20 parts of *A Natural History of the British Butterflies*, for which I enclose postal order for 17s. 6d.

Name.....

Address.....

Date.....

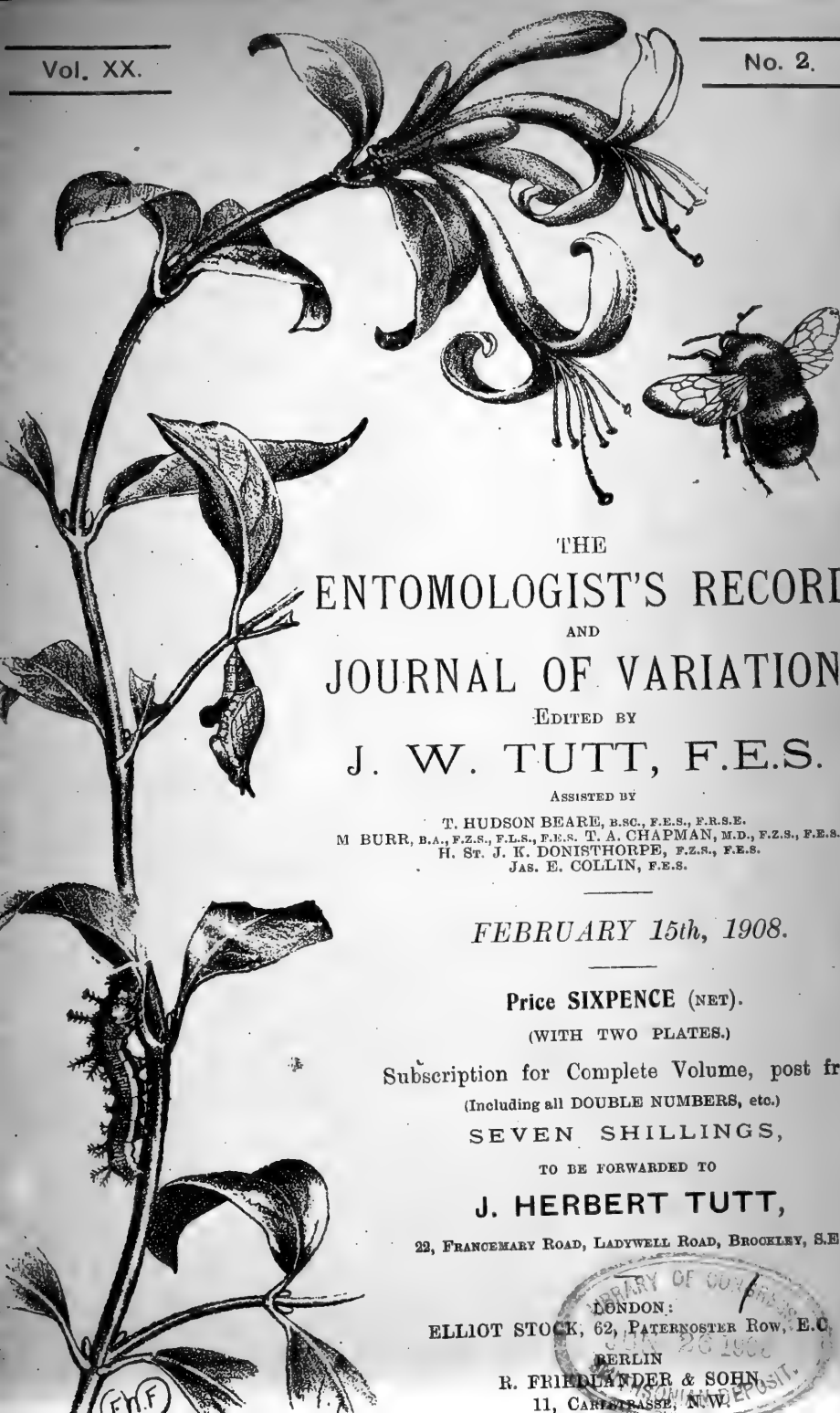
J. HERBERT TUTT, 119, Westcombe Hill, Blackheath, S.E.

FOR SALE. THE FOLLOWING RARE AND IMPORTANT ENTOMOLOGICAL WORKS AND PAMPHLETS.

The Acarina or Mites, by Nathan Banks. Demy 8vo., with 201 figures and Bibliography. Bound in cloth, gold-lettered	s. d. 6 0
Early Stages of Carabidæ, by George Dimmock and Frederick Knab. Demy 8vo. Four full-page plates and Bibliography. Bound in cloth, gold-lettered	6 0
Dragonfly Nymphs, by James G. Needham. Demy 8vo., with 7 full-page process plates and several figures. Bound in cloth, gold-lettered	6 0
Aleyrodids of California, by Florence E. Bemis. Demy 8vo., with 11 full-page plates. Bound in cloth, gold-lettered	5 0
Origin of Wings of Coleoptera, by W. L. Tower. Demy 8vo., splendidly illustrated with 7 double demy plates and Bibliography. Bound in cloth, gold-lettered	7 6
Genealogical Study of Dragonfly Wing Venation, by James G. Needham. Demy 8vo., with 24 full-page process plates and 44 figures. A most important work. Bound in cloth, gold lettered.	10 0
Revision of American Siphonaptera, by Carl F. Baker. Demy 8vo., with 17 full-page plates, complete Bibliography, &c. Bound in cloth, gold-lettered	7 6
Butterflies of Switzerland and Alps of Central Europe, by George Wheeler, M.A., 8vo. Strongly bound, 5s. 0d.; interleaved	6 0
Monograph of Peronea cristana and its aberrations (with beautiful chromo-lithograph plates), by J. A. Clark, F.E.S.	2 0
Notes on Hybrids of Tephrosia bistortata and Tephrosia crepuscularia, by J. W. Tutt, F.E.S.	1 0
Some results of recent experiments in hybridising Tephrosia bistortata and T. crepuscularia, by J. W. Tutt, F.E.S.	2 0
The drinking-habits of Butterflies and Moths, by J. W. Tutt, F.E.S.	1 6
The Lasiocampids, by J. W. Tutt, F.E.S.	1 0
Some considerations of Natural Genera and incidental reference to the nature of Species, by J. W. Tutt, F.E.S.	1 6
Some considerations of the nature and origin of species, by J. W. Tutt, F.E.S.	1 0
The Scientific aspect of Entomology (1) by J. W. Tutt, F.E.S.	1 0
" " " " (2) by J. W. Tutt, F.E.S.	1 0
A gregarious butterfly—Erebia nerine, by J. W. Tutt, F.E.S.	1 0
The nature of Metamorphosis, by J. W. Tutt, F.E.S.	1 0
Notes on the Zygenidæ, by J. W. Tutt, F.E.S.	1 0
Random Recollections of Woodland, Fen and Hill (1st edition), by J. W. Tutt, F.E.S.	3 0
Stray notes on the Noctuæ, by J. W. Tutt, F.E.S.	1 0
Presidential Address to the Entomological Society of London for 1896 by Prof. R. Meldola, F.R.S.	1 6
Presidential Address to the Entomological Society of London for 1897 by Prof. R. Meldola, F.R.S.	1 0
Presidential Address to the Entomological Society of London for 1899 by R. Trimmen, F.E.S.	1 0
Presidential Address to the Entomological Society of London for 1900 by G. H. Verrall, F.E.S.	1 0
Presidential Address to the Entomological Society of London for 1902 by Rev. Canon Fowler, M.A.	1 0
Distribution of European Erebias, by J. W. Tutt, F.E.S.	0 6
Chortodes morrisii, Morris=C. bondii, Knaggs, by J. W. Tutt, F.E.S.	1 0
A lutescent aberration of Epinephele tithonus, by J. W. Tutt, F.E.S.	0 6
The Variation of Papilio machaon, by W. Farren, F.E.S.	0 6
Collecting Noctuidæ by Lake Erie, by Professor A. R. Grote, M.A.	1 0
Catalogue of the Palearctic Dimorphides, Bombycides, Brahmæides and Attacides, by J. W. Tutt, F.E.S.	0 3
Catalogue of the Palearctic Lachneids, by J. W. Tutt, F.E.S.	0 6
Philosophical Aspects of Entomology, by J. W. Tutt, F.E.S.	0 6
Nomenclature, Phylogeny, and Synonymy, by J. W. Tutt, F.E.S.	0 6
Variation and Natural Selection as factors in species formation, by J. W. Tutt, F.E.S.	1 0
Correlation of the results arrived at in recent Papers on the Classification of Lepidoptera, by J. W. Tutt, F.E.S.	2 0
Catalogue of the Palearctic Psychides, by J. W. Tutt, F.E.S.	0 3
Hübner's "Tentamen," a verbatim reprint from one of the two only known copies in existence	0 6

Entomologists seeking books and pamphlets are invited to send their lists of desiderata.

Orders for the above to **A. H. 41, Wisteria Road, Lewisham, S.E.**



THE
ENTOMOLOGIST'S RECORD
AND
JOURNAL OF VARIATION

EDITED BY
J. W. TUTT, F.E.S.

ASSISTED BY
T. HUDSON BEARE, B.SC., F.E.S., F.R.S.E.
M BURR, B.A., F.Z.S., F.L.S., F.E.S. T. A. CHAPMAN, M.D., F.Z.S., F.E.S.
H. ST. J. K. DONISTHORPE, F.Z.S., F.E.S.
JAS. E. COLLIN, F.E.S.

FEBRUARY 15th, 1908.

Price SIXPENCE (NET).

(WITH TWO PLATES.)

Subscription for Complete Volume, post free
(Including all DOUBLE NUMBERS, etc.)

SEVEN SHILLINGS,

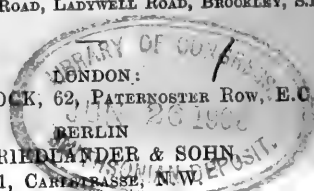
TO BE FORWARDED TO

J. HERBERT TUTT,

22, FRANCIS ROAD, LADYWELL ROAD, BROOKLYN, S.E.

LONDON:
ELLIOT STOCK, 62, PATERNOSTER ROW, E.C.

BERLIN
R. FRIEDLANDER & SOHN
11, CARLSTRASSE, N.W.



GRESHAM LIFE OFFICE.

Founded 1848.

Assets, £9,500,000.

NEW FEATURE.

Endowment Assurance Policy,
WITH CESSATION OF PREMIUMS
DURING INCAPACITY
(Temporary or Permanent.)

VERY MODERATE PREMIUMS.

Head Office—ST. MILDRED'S HOUSE, POULTRY, LONDON, E.C.

JAMES H. SCOTT, *General Manager and Secretary.*

THE GRESHAM LIFE ASSURANCE SOCIETY, LIMITED.

D. F. TAYLER & Co., Ltd., **Entomological Pin Manufacturers,**

SMALL HEADS AND PERFECT POINTS. WHITE, BLACK, AND GILT.

BIRMINGHAM and LONDON.

Can be obtained from Dealers throughout the World.

NEW FOREST BUTTERFLIES & MOTHS

Ova, Larvæ, Pupæ, and (bred) Imagines supplied to order by

G. TATE and SON,

Entomologists, Lyndhurst, New Forest.

Established 1870.

Instructions given in Practical Entomology. Correspondence invited.

LABELS ! LABELS !! LABELS !!!

It is very essential that every specimen, to be authentic, should bear a minute label, giving locality, date of capture, and name of captor.

3000

{ To comprise equal numbers of not more than ten localities.
Larger quantities *pro rata*. Orders executed in same order as
received. Remittance in full must accompany each order. }

5/-

Rannoch
16. vi. 97

New Forest
4. ix. 97

Shetland
5. v. 97

ADDRESS.—“Requisites,” Coombe Lodge, Mycenæ Road,
Westcombe Park, S.E.

Breeding Nets.

Wire frame bow-shaped nets, to slip on 5-inch and 8-inch flower-pots or saucers, open both ends. Useful for rearing larvæ on growing plants. Fold flat when not in use. 10in. by 9in., 9d.; 15in. by 12in., 1s. 6d. Also light pocket lamp-post nets, 2s., carriage paid.

S. W. GADGE, 68, Chestnut Grove, Balham.

A FRIENDLY RECOMMENDATION,

if you are feeling run down, or out of sorts, or suffer from a disordered state of the Liver, Kidneys, Stomach, or Bowels, would be to take a well-tried remedy. It would not be kindness to ask you to risk an experimental one. BEECHAM'S PILLS have a world-wide reputation, and sell by millions of boxes every year, and are every day maintaining tens of thousands of people in perfect health. The advice of these people would be to

TAKE

BEECHAM'S PILLS

for Sick-Headache, Indigestion, Poorness of Blood, Constipation, Biliousness, and Debility of the Nervous System. They give very speedy results, and quickly correct the irregularities that are causing you so much pain and anxiety. BEECHAM'S PILLS are composed entirely of medicinal herbs, and are warranted free from mercury or other substances. They can harm no one, and may be given to children, or to the aged and infirm, with perfect safety. It will be to your interest to do as many others are doing with such great advantage to themselves. Begin to take BEECHAM'S PILLS at once.

Prepared only by **THOMAS BEECHAM, St. Helens, Lancs.**

Sold everywhere in boxes, price $1/1\frac{1}{2}$ (56 pills) & 2/9 (168 pills.)

Subscriptions for Vol. XX (7 shillings) are now due, and should be sent without delay (and so save time and correspondence) to J. Herbert Tutt, 22, Francemary Road, Ladywell Road, Brockley, S.E. Will subscribers please oblige? [This subscription includes all numbers published from January 15th to December 15th, 1908.]

Non-receipt or errors in the sending of Subscribers' magazines should be notified to Mr. H. E. Page, "Bertrose," Gellatly Road, Hatcham, S.E.

NOTICE.

The Back Volumes (I-XIX) of *The Entomologist's Record*, &c., can be obtained at 10s. 6d. per Volume. Complete set of 18 vols. £6 13s. 6d. net. "Special Index" to Vols. III., IV., V., VI., VII., VIII., IX., X., XI., XII., XIII., XIV., XV., XVI., XVII., XVIII. and XIX., are sold separately, price 1/6 each. Single Back Numbers can be obtained at double the published price from 119, Westcombe Hill, Blackheath, S.E.

Subscribers are kindly requested to observe that subscriptions to *The Entomologist's Record*, &c., are payable in advance. The subscription (with or without the Special Index) is Seven Shillings, and must be sent to Mr. J. Herbert Tutt, 22, Francemary Road, Ladywell Road, Brockley, S.E. Cheques and Postal Orders should be made payable to J. W. TUTT.

ADVERTISEMENTS of Books and Insects for Sale will be inserted at a minimum charge of 2s. 6d. (for four lines). Longer Advertisements in proportion. A reduction made for a series. Particulars of Mr. J. Herbert Tutt, 22, Francemary Road, Ladywell Road, Brockley, S.E.

Subscribers who change their addresses must report the same to Mr. H. E. PAGE, "Bertrose," Gellatly Road, St. Catherine's Park, London, S.E., otherwise their magazines will probably be delayed, also to Mr. J. HERBERT TUTT, 22, Francemary Road, Ladywell Road, Brockley, S.E.

Articles for insertion and Exchanges should be sent to J. W. TUTT, Rayleigh Villa, Westcombe Hill, S.E., except notes relating to Coleoptera, which should be sent to Mr. H. DONISTHORPE, 58, Kensington Mansions, South Kensington, S.W., and of Orthoptera, to Mr. Burr, Sibertswood, near Dover.

Articles that require Illustration are inserted on condition that the author defrays the cost of the illustrations.

All Exchange Magazines must be forwarded to J. W. TUTT, Rayleigh Villa, Westcombe Hill, Blackheath, S.E.

EXCHANGES.—The use of this column for the offer of "Duplicates" and "Desiderata" and "Changes of address" is open free to subscribers personally so far as there is space available.

Duplicates.—*Peronea cristana*, vars. *Fulvostriana*, *Alboruficostana*, *Nigropunctana*, *Albovitana*, *Subvittana*, *Albipunctana*, *Punctana*, *Chantana*, *Merlana*, *Nigrana*, *Atrana*, *Nigroruficostana*, *Ulotana*, *Ochreapunctana*, *Xanthovittana* (and as last month.) For any specimens useful in my cabinets.—J. A. Clark, 57, Weston Park, Crouch End, N.

Duplicates.—Io, Urticæ, Sibylla, Semele, Adippe, Alveolus, Tages, Arion (fair), Argiolus ?, Alsus, W-album*, S. populi*, Revayana, Rubricollis (fair), Cristulalis (white pins), Aureola, Camelina, Carmelita (gilt pins), Dictæa, Batis, Flavicornis, Piniperda, Miniosa, Gothica, Brunnea, Baja, Rumicis, Rubricosa, Pistacina, Cytherea, Rufina, Neglecta, Tenebrosa, Vaccinii, Popularis, Oxyacanthæ, Aprilina, Saucia, Suffusa, Herbida, Stablis, Libatrix, Rhizolitha, Umbratica, Chrysis, Petrificata (fair), Hirtaria, Rostralis, Cytisaria, Exanthemaria, Unidentata, Procellata, Dubitata, Lobulata, Trepidaria, Parthenias, Triplasia, Fontis, Ulmata, Centaureata, Consortaria, Advenaria, Palumbaria.—*Percy M. Bright, Fairfield, Wimborne Road, Bournemouth.*

Duplicates.—Smaragdaria*, Unifasciata* (black pins). *Desiderata*.—Numerous.—*F. Wallace, 240, High Street, Stratford, E.*

Duplicates.—Ziczac*, Putris*, Gemina, Suffusa, Saucia, N. rubi, Rubricosa, Gracilis, Lunosa, Fulvago, Flavago, Nigrocincta (few fair), Nigra, Umbratica, Bidentata, Repandata, Bisetata, Virgularia, Exanthemata, Didymata, Multistrigaria, Albulata, Ruberata (worn), Galiata, Mercurella, Semifuscana, Conspersana, Vittella, Messaniella, Costosa, Nervosa, Arenella, Applana, and others. *Desiderata*.—Very many common insects to renew.—*Dr. Cassal, Ballaugh, Isle of Man.*

Desiderata.—Larvæ or pupæ of Crabroniformis.—*Richard South, 96, Drakefield Road, Upper Tooting, S.W.*

WANTED.—Good photographs or careful drawings of Aberrations, Gynandromorphs, etc., of any British "Blues," for reproduction in *The Natural History of the British Butterflies*. Also photos and good drawings of Aberrations and Gynandromorphs of other groups that may be used later as opportunity offers. [Specimens not necessarily British.] *J. W. Tutt, 119, Westcombe Hill, Blackheath.*

MEETINGS OF SOCIETIES.

Entomological Society of London.—11, Chandos Street, Cavendish Square, W., 8 p.m. Meetings—March 4th.

The City of London Entomological and Natural History Society.—London Institution, Finsbury Circus, E.C.—The first and third Tuesdays in the month, at 7.30 p.m., except in July and August. February 18th, "*Iodis lactearia*," by Rev. C. R. N. Burrows. March 3rd, Special Exhibition, "*Gnophos obscurata*"; March 17th, "*Cidaria truncata* and *C. immanata*," by L. B. Prout, F.E.S. April 7th, Discussion and Exhibition of "*Lithosiidae*," Mr. H. M. Edelsten, F.E.S.; April 21st, Special Exhibition—"The *Agrotis tritici* group." May 5th, "Notes on Canadian Lepidoptera," Mr. L. B. Prout, F.E.S.

Toynbee Hall Natural History Society.—Held at Toynbee Hall, Commercial Street, E., Mondays, at 8 p.m.—March 2nd-April 6th, "Some Factors producing Variation in Butterflies and Moths," J. W. Tutt. May 4th, Exhibition. Field Meetings—February 16th, Coudson (London Bridge, 10.25 a.m.); March 15th, Purley (London Bridge, 10.25 a.m.); April 11th, Loughton (Liverpool Street, 2 p.m.).

The South London Entomological and Natural History Society, Hibernia Chambers, London Bridge.—The second and fourth Thursdays in each month, at 8 p.m.—January 20th, March 13th.

North London Natural History Society, The Amherst Club, Amhurst Road, N. (No notices).

Lancashire and Cheshire Entomological Society.—Meetings at the Royal Institution, Liverpool, on the 3rd Monday in the month from October to April. Hon. Sec., H. R. Sweeting, 6, The Elms, Dingle, Liverpool.

Birmingham Entomological Society, at the rooms of the Birmingham Nat. Hist. and Philosophic Society, Avebury House, 55, Newball Street, at 8 p.m. February 17th (Annual).

Monograph of the British Pterophorina.

By J. W. TUTT, F.E.S.

(Demy 8vo., 161 pp., bound in Cloth.)

Price 5/- net.

This book contains an introductory chapter on "Collecting," "Killing" and "Setting" the Pterophorina, a table giving details of each species—Times of appearance of larva, of pupa, and of imago, food-plants, mode of pupation, and a complete account (so far as is known) of every British species, under the headings of "Synonymy," "Imago," "Variation," "Ovum," "Larva," "Food-plants," "Pupa," "Habitat," and "Distribution." It is much the most complete and trustworthy account of this interesting group of Lepidoptera that has ever been published.

J. HERBERT TUTT, 22, Francemary Road, Ladywell Road, Brockley, S.E.

Practical Hints for the Field Lepidopterist.

By J. W. TUTT, F.E.S.

TWO PARTS (interleaved for Collector's own notes),

Containing about 3000 Practical Hints of the form so well known.

Together with General and Specific Index by H. J. Turner, F.E.S. Together with Chapters on the Preservation, Mounting, and Photographing of Eggs, by F. Noad Clark and A. E. Tonge.

And also Chapters on Collections, Collecting, Collectors, The Egg and Eggstage, the Larva and Larval Stage, the Pupa and Pupal Stage (with model descriptions and hints for useful records), the whole illustrated by

SEVEN CAREFULLY EXECUTED PLATES.

Making this the most important book on the subject ever offered to the field lepidopterist.

PRICE—SIX SHILLINGS EACH PART (not interleaved).

(An Encyclopædia of Field Lepidopterology.)

A Natural History of the British Butterflies

By J. W. TUTT, F.E.S.

Published in Parts, price 1s. each (or £1 for the complete series of 22 or 23 Parts).

The **general subject** so far has been treated in the following Chapters—"The Æstivation and Hybernation of Butterfly Larvæ;" "The Gregarious Habit in Butterfly Larvæ;" "Family Habits in Butterfly Larvæ—(1) The Vanessids, (2) The Fritillaries, (3) The Limenitids, (4) The Apaturids, (5) The Satyrids, (6) The Pierids, (7) The Coliads, etc., (8) The Hairstreaks, (9) The Lycenids, etc."

The **systematic part** deals with the following—"The Ruralides or hairstreaks," "The Genus *CALLOPHRYS*," "*CALLOPHRYS RUBI*: Synonymy—Original description—Sexual dimorphism—Variation (vars. *minor*, *major*, *suffusa*, *fervida*, *intermedia*, *caerulescens*, *punctata*, *inferopunctata*, *incompleta*, *bipunctata*, *caecus*, *pallida*, *borealis*, *sibirica*, *nordlandica*, *suaveola*, etc.)—Nature of the green colouring of the underside of *Callophrys rubi*—Pathological examples—Egglaying—Ovum—Habits of larva—Larva—Variation of larva—Foodplants—Pupation—Pupa—Pupal dehiscence—Stridulation of the pupa—Time of appearance—Habits—Habitat—British localities—Distribution (throughout the world)." "Tribe *STRYMONIDI* or *THECLIDI*," "The genus *EDWARDSIA*," "*EDWARDSIA (THECLA) W-ALBUM*: Synonymy—Original description—Imago—Sexual dimorphism—Variation (vars. *minor*, *major*, *obsoleta*, *albovirgata*, *semialbovirgata*, *sutchani*, *butlerowi*, *fentoni*, etc.)—Comparison with *Felderia eximia*—Pathological examples—Egglaying—Ovum—Habits of larva—Larva—Variation in larva—Larval moults—Colour change of larva during resting-period preceding pupation—Foodplants—Parasites—Silk-spinning in preparation for pupation—Pupation—Colour changes during maturation of pupa—Pupa—Time of appearance—Habits—Habitat—British localities—Distribution (world-wide)." "Genus *STRYMON*," "*STRYMON (THECLA) PRUNI*: Synonymy—Original description—Imago—Sexual dimorphism—Variation (vars. *progressa*, *excessa*, *ptorsas*, *fulvior*, *minor*, *major*, *pallida*, *paupera*, *albofasciata*, *semialbofasciata*, *obsoleta*, etc.)—Teratological examples—Egglaying—Ovum—Habits of larva—Larva—Variation of larva—Quiescent stage of larva preceding pupation—Foodplants—Parasites—Pupation—Process of pupation and development of pupal form—Maturation of pupa—Pupa—Dehiscence of pupa—Time of appearance—Habits—Habitats—British localities—Distribution (world-wide)."

The "Tribe *RURALIDI*," "Genus *BITHYS*," "*BITHYS QUERCUS*," "Genus *RURALIS*," "*RURALIS BETULÆ*," "The subfamily *LYCENINÆ*," "The genus *LAMPIDES*," "*LAMPIDES BETHICUS*," "The tribe *CELASTRINIDI* and the genus *CELASTRINA*," "*CELASTRINA ARGOLUS*," etc., are all treated in the same detailed fashion.

Some of the **plates** are as follows—Plate I: British Hairstreaks (22 figures of imagines); Plate II: Eggs of British Hairstreaks (15 figures); Plate III: (1) Pupal Skin and Pupal Hairs of *Edwardsia w-album*, (2) Pupal Skin and Pupal Hairs of *Bithys quercus*; Plate IV: Lifehistory of *Callophrys rubi*—egg (4 figures), larva (7 figures), pupa (2 figures), imago (resting position alive); Plate V: Pupal skin, Pupal hairs, and spiracle of *Callophrys rubi*; and so on up to Plate XXV.

Dear Sir,—

Please forward me all the parts comprised in Vol. II of *The Natural History of British Butterflies*, parts 1-17 forthwith, the other parts as published, for which I forward herewith Postal Order for £1.

Name

Address

Date

Mr. J. H. TUTT, 22, Francemary Road, Ladywell Road, Brockley, S.E.

FOR SALE.

AS GOOD AS NEW

A NATURAL HISTORY OF THE BRITISH LEPIDOPTERA
Vols. I-IV. PRICE £2 2s.

ALSO A COPY OF

A NATURAL HISTORY OF THE BRITISH BUTTERFLIES
Vol. I. Price 17s. 6d.

Apply—**A. H., 41, Wisteria Road, Lewisham, S.E.**

FOR SALE.

A NATURAL HISTORY OF THE BRITISH LEPIDOPTERA

By **J. W. TUTT, F.E.S.**

First three vols. 30/-, also vols. 1-6 of Entomologist's Record, bound in three vols. 15/-.

W. HAWKER SMITH, 23, High Street, Tring, Herts.

FOR SALE.

Barrett's Lepidoptera of the British Isles.

Parts 1-89. Coloured Illustrations. Seven volumes bound in cloth.
Remaining parts unbound.

Almost new condition—Cost £23 16s. 6d. will take £11 11s.

Apply—**Miss E. M. GLADSTONE, 34, Barons Court Road,
London, S.E.**

**IMPORTANT COLLECTION OF BRITISH
LEPIDOPTERA.**

On *TUESDAY, March 3rd, at 1 o'clock,*

Mr. J. C. Stevens,

will offer at his rooms—38, KING STREET, COVENT GARDEN, W.C.

. . . THE EXTENSIVE . . .

Collection of British Lepidoptera

FORMED BY

W. TUNSTALL, F.E.S.

Containing long series of rare species in fine and perfect condition, together with the cabinets in which they are contained.

On view day prior 10 to 5 and morning of sale. Catalogues on application.

WATKINS & DONCASTER,

Naturalists and Manufacturers of Entomological Apparatus and Cabinets.

Plain Ring Nets, wire or cane, including Stick, 1/3, 2/-, 2/6. Folding Nets, 3/6, 4/-.
Umbrella Nets (self-acting), 7/- . Pocket Boxes, 6d., 9d., 1/-, 1/6. Zinc Relaxing Boxes,
9d., 1/-, 1/6, 2/- . Nested Chip Boxes, 7d. per four dozen. Entomological Pins, assorted
or mixed, 1/-, 1/6 per ounce. Pocket Lanterns, 2/6 to 8/- . Sugaring Tin, with brush, 1/6,
2/- . Sugaring Mixture, ready for use, 1/9 per tin. Store-Boxes, with camphor cells, 2/6,
4/-, 5/-, 6/- . Setting-Boards, flat or oval, 1in., 6d.; 1½in., 8d.; 2in., 10d.; 2½in., 1/-;
3½in., 1/4; 4in., 1/6; 5in., 1/10; Complete Set of fourteen Boards, 10/6. Setting Houses,
9/6, 11/6; corked back, 14/- . Zinc Larva Boxes, 9d., 1/-, 1/6. Breeding Cage, 2/6, 4/-,
5/-, 7/6. Coleopterist's Collecting Bottle, with tube, 1/6, 1/8. Botanical Cases, japanned,
double tin, 1/6 to 4/6. Botanical Paper, 1/1, 1/4, 1/9, 2/2 per quire. Insect Glazed Cases,
2/6 to 11/- . Cement for replacing Antennæ 4d. per bottle. Steel Forceps, 1/6, 2/-, 2/6 per
pair. Cabinet Cork, 7 by 3½, best quality 1/6 per dozen sheets. Brass Chloroform Bottle,
2/6. Insect Lens, 1/- to 8/- . Glass-top and Glass-bottomed Boxes, from 1/- per dozen.
Zinc Killing Box, 9d. to 1/- . Pupa Digger, in leather sheath, 1/9. Taxidermist's Com-
panion, containing most necessary implements for skinning, 10/6. Scalpels, 1/3; Scissors,
2/- per pair; Eggdrills, 2d., 3d., 9d.; Blowpipes, 4d.; Artificial Eyes for Birds and
Animals; Label-lists of British Butterflies, 2d.; ditto of Birds' Eggs, 2d., 3d., 6d.; ditto
of Land and Fresh-water Shells, 2d.; Useful Books on Insects, Eggs, etc.

THE WAND TELESCOPE NET (An innovation in Butterfly Nets).

We beg to call your attention to our new Telescopic Handle for butterfly nets. It is
made entirely in brass, and is light and strong, and, moreover, it can be shut up to carry
in small compass. A very compact pattern, effecting great saving in weight and bulk.

Prices—2 joints, 8/6; 3 joints, 9/6; 4 joints, 10/6.

Complete with cane folding ring and bag. We shall be pleased to send on application.

SHOW ROOM FOR CABINETS

Of every description of INSECTS, BIRDS' EGGS, COINS, MICROSCOPICAL OBJECTS, FOSSILS, &c.

Catalogue (100 pages) sent on application, post free.

LARGE STOCK OF INSECTS AND BIRDS' EGGS (British, European, and Exotic.)
Birds, Mammals, etc., Preserved and Mounted by First-class Workmen.

Only
Address—36, STRAND, LONDON, W.C. (5 doors from Charing Cross)

OVA, LARVÆ, AND PUPÆ.

The Largest Breeder of Lepidoptera in the British Isles is

H. W. HEAD, Entomologist,
SCARBOROUGH.

*Full List of Ova, Larvae, and Pupae, also Lepidoptera, Apparatus, Cabinets,
etc., sent on application.*

Many Rare British Species and Good Varieties for Sale.

Lantern Slides in Natural Colours.

LEPIDOPTERA & LARVÆ A SPECIALITY.

Photographed from life and true to Nature in every detail.

SLIDES OF BIRDS, WILD FLOWERS, &c.,

By same Colour Process.

LANTERN SLIDES MADE TO ORDER FROM ANY SPECIMEN OR COLOURED DRAWING.

**PHOTOS IN COLOUR OF LARVÆ, LIFE SIZE, ON IVORINE
TABLETS TO PIN IN THE CABINET.**

For List apply to—

CHARLES D. HEAD, 2, Mount Vernon, Dollymount, DUBLIN.

TEMPORARY OFFER.

REDUCTION OF £3 8s.

THE
NATURAL HISTORY OF THE
BRITISH LEPIDOPTERA

By J. W. TUTT, E.E.S.

Vols. I, II, III, IV, V, VIII, and IX.

(Bound in Cloth, complete.)

The nearness of the completion of Vol. IX of this important work, leads us to make the following offer, *which will be withdrawn as soon as Vol. IX is officially published*, when the standard net price of £1 per volume will be insisted upon as hitherto, viz., **The seven vols. will be forwarded for £5 12s.—Vols. I, II, III, IV, V, and VIII to be sent at once and Vol. IX as soon as published.**

In spite of the apparent dearth of this work, it is in reality the *cheapest ever published*. Each volume averages more than 500 pages of solid Long Primer and Brevier, of demy 8vo. size; all the contents consisting of summarised detail, and without any superfluous padding. It is a book for students, who really want all the available information on the subject dealt with. It is the standard work in use among all the best scientific lepidopterists on the continent as well as in the British Islands, and is possibly more often referred to by workers on the Palaearctic fauna than any other book in existence. It covers all the Continental work ever done on the groups treated, and not only gives the facts, but informs the student how to get at everything published on the subject he is reading.

The illustrations of the later volumes are quite unequalled. There are, in the volume now being published, *full-page life-histories of each species*, and detailed structural plates of egg, larvæ and larval hairs, spiracles, etc., pupæ and pupal hairs, spiracles, etc., and other items illustrating quite new discoveries in the structure of the early stages, etc.

The series of volumes forms indeed a standard work of reference, and any lepidopterist who possesses the volumes wants rarely to make reference to outside libraries for any detail, however unusual, on the subjects treated.

The general chapters, too, are summaries of everything known and published on the various subjects. The preliminary chapters, also, introducing each superfamily, covers the world-wide literature, and questions of classification and systematic entomology are discussed from the broad standpoint of the fauna of the world, and not from any restricted or limited point of view. The work, therefore, is one that appeals to all lepidopterists.

This offer can only be considered by being made directly to Mr. J. H. TUTT. **Single volumes can only be supplied at £1 net.**

DEAR SIR,—

Please forward me Vols. I, II, III, IV, V, and VIII of *The Natural History of British Lepidoptera* at once, and Vol. IX as soon as published, for which I send herewith Cheque (or Postal Order) for £5 12s.

Name.....

Address.....

Date.....

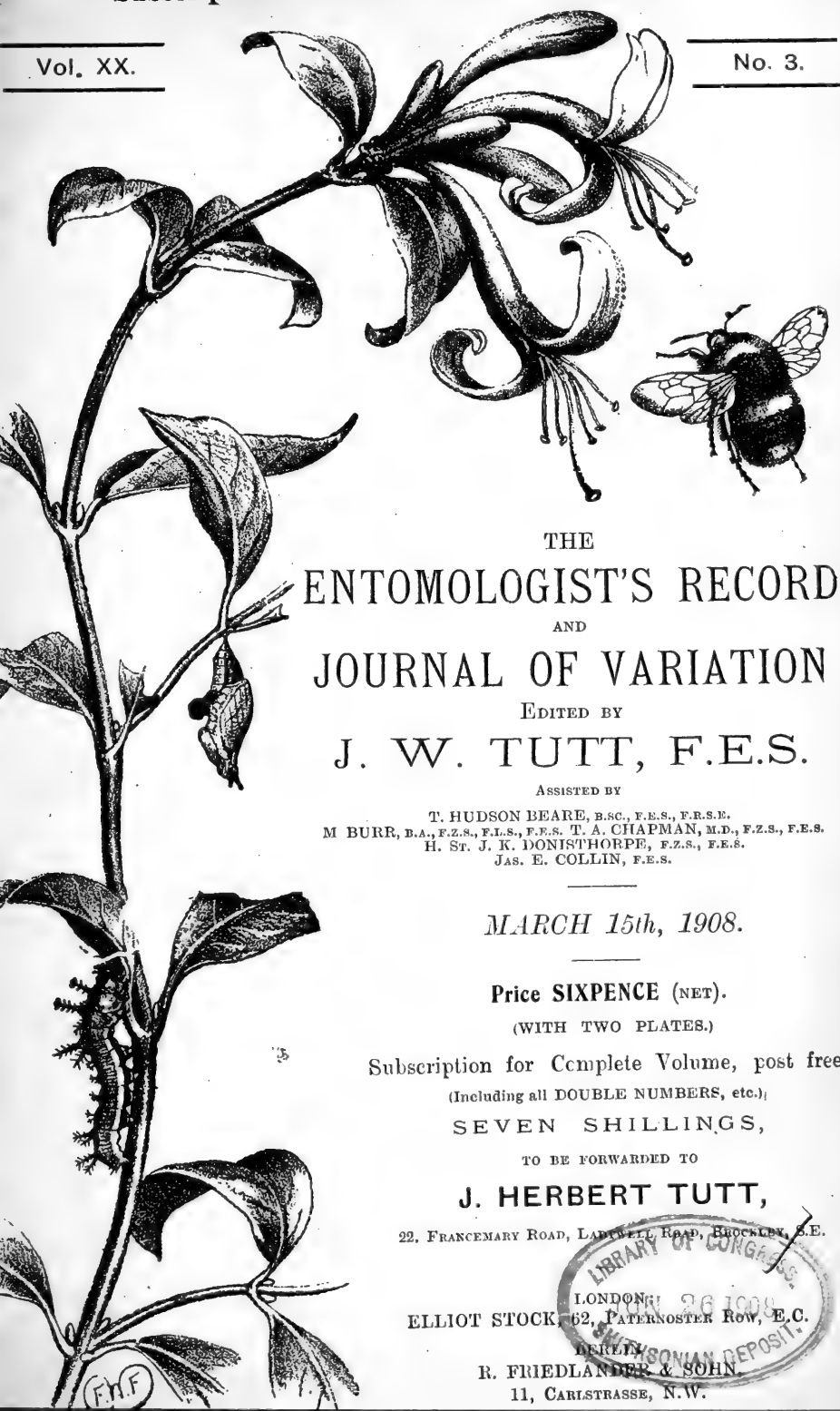
Mr. J. HERBETT TUTT,

22, Francemary Road, Ladywell Road, Brockley, S.E.

Subscriptions for Vol. XX are now overdue.

Vol. XX.

No. 3.



THE
ENTOMOLOGIST'S RECORD
AND
JOURNAL OF VARIATION
EDITED BY
J. W. TUTT, F.E.S.

ASSISTED BY

T. HUDSON BEARE, B.Sc., F.E.S., F.R.S.E.
M. BURR, B.A., F.Z.S., F.L.S., F.E.S. T. A. CHAPMAN, M.D., F.Z.S., F.E.S.
H. ST. J. K. DONISTHORPE, F.Z.S., F.E.S.
JAS. E. COLLIN, F.E.S.

MARCH 15th, 1908.

Price SIXPENCE (NET).

(WITH TWO PLATES.)

Subscription for Complete Volume, post free

(Including all DOUBLE NUMBERS, etc.).

SEVEN SHILLINGS,

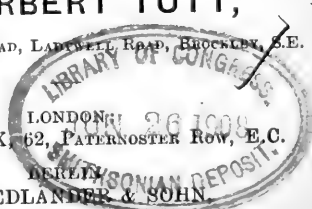
TO BE FORWARDED TO

J. HERBERT TUTT,

22, FRANCIS ROAD, LADBROKE ROAD, BRISTOL, S.E.

LONDON: ELLIOT STOCK, 62, PATERNOSTER ROW, E.C.

R. FRIEDLANDER & SOHN,
11, CARLSTRASSE, N.W.



GRESHAM LIFE OFFICE.

Founded 1848.

Assets, £9,500,000.

NEW FEATURE.

Endowment Assurance Policy,
WITH CESSATION OF PREMIUMS
DURING INCAPACITY
(Temporary or Permanent.)

VERY MODERATE PREMIUMS.

Head Office—ST. MILDRED'S HOUSE, POULTRY, LONDON, E.C.

JAMES H. SCOTT, *General Manager and Secretary.*

THE GRESHAM LIFE ASSURANCE SOCIETY, LIMITED.

D. F. TAYLER & Co., Ltd., **Entomological Pin Manufacturers,**

SMALL HEADS AND PERFECT POINTS. WHITE, BLACK, AND GILT.

BIRMINGHAM and LONDON.

Can be obtained from Dealers throughout the World.

NEW FOREST BUTTERFLIES & MOTHS

Ova, Larvæ, Pupæ, and (bred) Imagines supplied to order by

G. TATE and SON,

Entomologists, Lyndhurst, New Forest.

Established 1870.

Instructions given in Practical Entomology. Correspondence invited.

LABELS ! LABELS !! LABELS !!!

It is very essential that every specimen, to be authentic, should bear a minute label, giving locality, date of capture, and name of captor.

3000

{ To comprise equal numbers of not more than ten localities.
Larger quantities *pro rata*. Orders executed in same order as
received. Remittance in full must accompany each order. }

5/-

Rannoch
16. vi. 97

New Forest
4. ix. 97

Shetland
5. v. 97

**ADDRESS.—“ Requisites,” Coombe Lodge, Mycenæ Road,
Westcombe Park, S.E.**

Breeding Nets.

Wire frame bow-shaped nets, to slip on 5-inch and 8-inch flower-pots or saucers, open both ends. Useful for rearing larvæ on growing plants. Fold flat when not in use. 10in. by 9in., 9d.; 15in. by 12in., 1s. 6d. Also light pocket lamp-post nets, 2s., carriage paid.

S. W. GADGE, 68, Chestnut Grove, Balham.

A FRIENDLY RECOMMENDATION,

if you are feeling run down, or out of sorts, or suffer from a disordered state of the Liver, Kidneys, Stomach, or Bowels, would be to take a well-tried remedy. It would not be kindness to ask you to risk an experimental one. BEECHAM'S PILLS have a world-wide reputation, and sell by millions of boxes every year, and are every day maintaining tens of thousands of people in perfect health. The advice of these people would be to

TAKE

BEECHAM'S PILLS

for Sick-Headache, Indigestion, Poorness of Blood, Constipation, Biliousness, and Debility of the Nervous System. They give very speedy results, and quickly correct the irregularities that are causing you so much pain and anxiety. BEECHAM'S PILLS are composed entirely of medicinal herbs, and are warranted free from mercury or other substances. They can harm no one, and may be given to children, or to the aged and infirm, with perfect safety. It will be to your interest to do as many others are doing with such great advantage to themselves. Begin to take BEECHAM'S PILLS at once.

Prepared only by **THOMAS BEECHAM, St. Helens, Lancs.**

Sold everywhere in boxes, price 1/1½ (56 pills) & 2/9 (168 pills.)

Subscriptions for Vol. XX (7 shillings) are now overdue, and should be sent without delay (and so save time and correspondence) to J. Herbert Tutt, 22, Francemary Road, Ladywell Road, Brockley, S.E. Will subscribers please oblige? [This subscription includes all numbers published from January 15th to December 15th, 1908.]

Non-receipt or errors in the sending of Subscribers' magazines should be notified to Mr. H. E. Page, "Bertrose," Gellatly Road, Hatcham, S.E.

NOTICE.

The Back Volumes (I-XIX) of *The Entomologist's Record*, &c., can be obtained at 10s. 6d. per Volume. Complete set of 18 vols. £6 13s. 6d. net. "Special Index" to Vols. III., IV., V., VI., VII., VIII., IX., X., XI., XII., XIII., XIV., XV., XVI., XVII., XVIII. and XIX., are sold separately, price 1/6 each. Single Back Numbers can be obtained at double the published price from 119, Westcombe Hill, Blackheath, S.E.

Subscribers are kindly requested to observe that subscriptions to *The Entomologist's Record*, &c., are payable in advance. The subscription (with or without the Special Index) is Seven Shillings, and must be sent to Mr. J. Herbert Tutt, 22, Francemary Road, Ladywell Road, Brockley, S.E. Cheques and Postal Orders should be made payable to J. W. TUTT.

ADVERTISEMENTS of Books and Insects for Sale will be inserted at a minimum charge of 2s. 6d. (for four lines). Longer Advertisements in proportion. A reduction made for a series. Particulars of Mr. J. Herbert Tutt, 22, Francemary Road, Ladywell Road, Brockley, S.E.

Subscribers who change their addresses must report the same to Mr. H. E. PAGE, "Bertrose," Gellatly Road, St. Catherine's Park, London, S.E., otherwise their magazines will probably be delayed, also to Mr. J. HERBERT TUTT, 22, Francemary Road, Ladywell Road, Brockley, S.E.

Articles for insertion and Exchanges should be sent to J. W. TUTT, Rayleigh Villa, Westcombe Hill, S.E., except notes relating to Coleoptera, which should be sent to Mr. H. DONISTHORPE, 58, Kensington Mansions, South Kensington, S.W., and of Orthoptera, to Mr. BURR, Sibertswood, near Dover.

Articles that require illustration are inserted on condition that the author defrays the cost of the illustrations.

All Exchange Magazines must be forwarded to J. W. TUTT, Rayleigh Villa, Westcombe Hill Blackheath, S.E.

EXCHANGES.—The use of this column for the offer of "Duplicates" and "Desiderata" and "Changes of address" is open free to subscribers personally so far as there is space available.

Desiderata.—Larvæ or pupæ of Crabroniformis.—J. Gander, 16, King's Road, Berkhamshead.

WANTED.—Good photographs or careful drawings of Aberrations, Gynandromorphs, etc., of any British "Blues," for reproduction in *The Natural History of the British*

Butterflies. Also photos and good drawings of Aberrations and Gynandromorphs of other groups that may be used later as opportunity offers. [Specimens not necessarily British.]
J. W. Tutt, 119, Westcombe Hill, Blackheath.

MEETINGS OF SOCIETIES.

Entomological Society of London.—11, Chandos Street, Cavendish Square, W., 8 p.m. Meetings—March 18th, April 1st.

The City of London Entomological and Natural History Society.—London Institution, Finsbury Circus, E.C.—The first and third Tuesdays in the month, at 7.30 p.m., except in July and August. March 17th, "*Cidaria truncata* and *C. immanata*," by L. B. Prout, F.E.S. April 7th, Discussion and Exhibition of "*Lithosiidae*," Mr. H. M. Edelsten, F.E.S.; April 21st, Special Exhibition—"The *Agrotis tritici* group." May 5th, "Notes on Canadian Lepidoptera," Mr. L. B. Prout, F.E.S.

Toynbee Hall Natural History Society.—Held at Toynbee Hall, Commercial Street, E., Mondays, at 8 p.m.—April 6th, "Some Factors producing Variation in Butterflies and Moths," J. W. Tutt. May 4th, Exhibition. Field Meetings—March 15th, Purley (London Bridge, 10.25 a.m.); April 11th, Loughton (Liverpool Street, 2 p.m.).

The South London Entomological and Natural History Society, Hibernia Chambers, London Bridge.—The second and fourth Thursdays in each month, at 8 p.m.—March 26th, April 9th.

North London Natural History Society, The Amherst Club, Amhurst Road, N. (No notices).

Lancashire and Cheshire Entomological Society.—Meetings at the Royal Institution, Liverpool, on the 3rd Monday in the month from October to April. Hon. Sec., H. R. Sweeting, 6, The Elms, Dingle, Liverpool.

Birmingham Entomological Society, at the rooms of the Birmingham Nat. Hist. and Philosophic Society, Avebury House, 55, Newball Street, at 8 p.m.

Monograph of the British Pterophorina.

By J. W. TUTT, F.E.S.

(Demy 8vo., 161 pp., bound in Cloth.)

Price 5/- net.

This book contains an introductory chapter on "Collecting," "Killing" and "Setting" the Pterophorina, a table giving details of each species—Times of appearance of larva, of pupa, and of imago, food-plants, mode of pupation, and a complete account (so far as is known) of every British species, under the headings of "Synonymy," "Imago," "Variation," "Ovum," "Larva," "Food-plants," "Pupa," "Habitat," and "Distribution." It is much the most complete and trustworthy account of this interesting group of Lepidoptera that has ever been published.

J. HERBERT TUTT, 22, Francemary Road, Ladywell Road, Brockley, S.E.

FOR SALE.

A GOOD COPY OF

A NATURAL HISTORY OF THE BRITISH BUTTERFLIES

Vol. I. Price 17s. 6d.

Apply—A. H., 41, Wisteria Road, Lewisham, S.E.

FOR SALE.

. . . A SECOND HAND . . .

ENTOMOLOGICAL CABINET,

24 drawers 15" × 17½". Camphor cell all round. Book case on top.

Also a magnificent Zebra-wood SHELL CABINET.

Price £20 or offers.

Mrs. WOLLASTON, 1, Barnepark Terrace, Teignmouth, Devonshire.

FOR SALE. THE FOLLOWING RARE AND IMPORTANT ENTOMOLOGICAL WORKS AND PAMPHLETS.

The Acarina or Mites, by Nathan Banks. Demy 8vo., with 201 figures and Bibliography. Bound in cloth, gold-lettered ..	s. d. 6 0
Early Stages of Carabidæ, by George Dimmock and Frederick Knab. Demy 8vo. Four full-page plates and Bibliography. Bound in cloth, gold-lettered ..	6 0
Dragonfly Nymphs, by James G. Needham. Demy 8vo., with 7 full-page process plates and several figures. Bound in cloth, gold-lettered ..	6 0
Aleyrodids of California, by Florence E. Bemis. Demy 8vo., with 11 full-page plates. Bound in cloth, gold-lettered ..	5 0
Origin of Wings of Coleoptera, by W. L. Tower. Demy 8vo., splendidly illustrated with 7 double demy plates and Bibliography. Bound in cloth, gold-lettered ..	7 6
Genealogical Study of Dragonfly Wing Venation, by James G. Needham. Demy 8vo., with 24 full-page process plates and 44 figures. A most important work. Bound in cloth, gold lettered. ..	10 0
Revision of American Siphonaptera, by Carl F. Baker. Demy 8vo., with 17 full-page plates, complete Bibliography, &c. Bound in cloth, gold-lettered ..	7 6
Notes on Hybrids of <i>Tephrosia bistortata</i> and <i>Tephrosia crepuscularia</i> , by J. W. Tutt, F.E.S.	1 0
Some results of recent experiments in hybridising <i>Tephrosia bistortata</i> and <i>T. crepuscularia</i> , by J. W. Tutt, F.E.S.	2 0
The drinking-habits of Butterflies and Moths, by J. W. Tutt, F.E.S.	1 6
The Lasio campids, by J. W. Tutt, F.E.S.	1 0
Some considerations of Natural Genera and incidental reference to the nature of Species, by J. W. Tutt, F.E.S.	1 6
Some considerations of the nature and origin of species, by J. W. Tutt, F.E.S.	1 0
The Scientific aspect of Entomology (1) by J. W. Tutt, F.E.S.	1 0
" " " " (2) by J. W. Tutt, F.E.S.	1 0
A gregarious butterfly— <i>Erebia nerine</i> , by J. W. Tutt, F.E.S.	1 0
The nature of Metamorphosis, by J. W. Tutt, F.E.S.	1 0
Notes on the Zygænidæ, by J. W. Tutt, F.E.S.	1 0
Random Recollections of Woodland, Fen and Hill (1st edition), by J. W. Tutt, E.E.S.	3 0
Stray notes on the Noctuæ, by J. W. Tutt, F.E.S.	1 0
Presidential Address to the Entomological Society of London for 1896 by Prof. R. Meldola, F.R.S.	1 6
Presidential Address to the Entomological Society of London for 1897 by Prof. R. Meldola, F.R.S.	1 0
Presidential Address to the Entomological Society of London for 1899 by R. Trimen, F.E.S.	1 0
Presidential Address to the Entomological Society of London for 1900 by G. H. Verrall, F.E.S.	1 0
Presidential Address to the Entomological Society of London for 1902 by Rev. Canon Fowler, M.A.	1 0
Distribution of European Erebias, by J. W. Tutt, F.E.S.	0 6
<i>Chortodes morrisii</i> , Morris = <i>C. bondii</i> , Knaggs, by J. W. Tutt, F.E.S.	1 0
A lutescent aberration of <i>Epinephele tithonus</i> , by J. W. Tutt, F.E.S.	0 6
The Variation of <i>Papilio machaon</i> , by W. Farren, F.E.S.	0 6

Entomologists seeking books and pamphlets are invited to send their lists of desiderata.

Orders for the above to **A. H. 41, Wisteria Road, Lewisham, S.E.**

Practical Hints for the Field Lepidopterist.

By J. W. TUTT, F.E.S.

TWO PARTS (interleaved for Collector's own notes),

Containing about 3000 Practical Hints of the form so well known.

Together with General and Specific Index by H. J. Turner, F.E.S. Together with Chapters on the Preservation, Mounting, and Photographing of Eggs, by F. Noad Clark and A. E. Tonge.

And also Chapters on Collections, Collecting, Collectors, The Egg and Eggstage, the Larva and Larval Stage, the Pupa and Pupal Stage (with model descriptions and hints for useful records), the whole illustrated by

SEVEN CAREFULLY EXECUTED PLATES.

Making this the most important book on the subject ever offered to the field lepidopterist.

PRICE—SIX SHILLINGS EACH PART (not interleaved).

(An Encyclopædia of Field Lepidopterology.)

TEMPORARY OFFER.

REDUCTION IN PRICE.

. . . A . . .

NATURAL HISTORY OF THE BRITISH BUTTERFLIES

By J. W. TUTT, F.E.S.

Vols. I and II.

(Bound in Cloth, complete.)

The nearness of the completion of *Vol. II* of this important work, leads us to make the following offer, *which will be withdrawn as soon as Vol. II is officially published*, when the standard net price of £1 per volume will be insisted upon as hitherto, *viz.*, **The two vols. will be forwarded for £1 12s. 6d.—Vol. I to be sent at once and Vol. II as soon as published.**

In spite of the *apparent* dearness of this work, it is in reality the *cheapest ever published*. Each volume averages *more than 500 pages* of solid Long Primer and Brevier, of demy 8vo. size; all the contents consisting of summarised detail, and without any superfluous padding. It is a *book for students*, who really want *all the available information on the subject* dealt with. It is the *standard work* in use among *all the best scientific lepidopterists on the continent* as well as in the British Islands, and is *possibly more often referred to by workers on the Palearctic fauna* than any other book in existence. It covers *all the Continental work ever done* on the groups treated, and not only gives the facts, but informs the student how to get at everything published on the subject he is reading.

The *illustrations* of these two volumes are *quite unequalled*. There are, in the volume now being published, *full-page life-histories of each species*, and *detailed structural plates* of egg, larvæ and larval hairs, spiracles, etc., pupæ and pupal hairs, spiracles, etc., and other *items illustrating quite new discoveries* in the structure of the early stages, etc.

The series of volumes forms indeed a standard work of reference, and any lepidopterist who possesses the volumes wants rarely to make reference to outside libraries for any detail, however unusual, on the subjects treated.

The general chapters, too, are summaries of everything known and published on the various subjects. The preliminary chapters, also, introducing each superfamily, covers the world-wide literature, and questions of classification and systematic entomology are discussed from the broad standpoint of the fauna of the world, and not from any restricted or limited point of view. The work, therefore, is one that appeals to all lepidopterists.

This offer can only be considered by being made directly to Mr. J. H. TUTT. **Single volumes can only be supplied at £1 net.**

DEAR SIR,—

Please forward me Vol. I of *The Natural History of British Butterflies* at once, and Vol. II as soon as published, for which I send herewith Cheque (or Postal Order) for £1 12s. 6d.

Name.....

Address.....

Date.....

Mr. J. HERBERT TUTT,

22, Francemary Road, Ladywell Road, Brockley, S.E.

WATKINS & DONCASTER,

Naturalists and Manufacturers of Entomological Apparatus and Cabinets.

Plain Ring Nets, wire or cane, including Stick, 1/3, 2/-, 2/6. Folding Nets, 3/6, 4/-. Umbrella Nets (self-acting), 7/-. Pocket Boxes, 6d., 9d., 1/-, 1/6. Zinc Relaxing Boxes, 9d., 1/-, 1/6, 2/-. Nested Chip Boxes, 7d. per four dozen. Entomological Pins, assorted or mixed, 1/-, 1/6 per ounce. Pocket Lanterns, 2/6 to 8/-. Sugaring Tin, with brush, 1/6, 2/-. Sugaring Mixture, ready for use, 1/9 per tin. Store-Boxes, with camphor cells, 2/6, 4/-, 5/-, 6/-. Setting-Boards, flat or oval, lin., 6d.; 1½in., 8d.; 2in., 10d.; 2½in., 1/-; 3½in., 1/4; 4in., 1/6; 5in., 1/10; Complete Set of fourteen Boards, 10/6. Setting Houses, 9/6, 11/6; corked back, 14/-. Zinc Larva Boxes, 9d., 1/-, 1/6. Breeding Cage, 2/6, 4/-, 5/-, 7/6. Coleopterist's Collecting Bottle, with tube, 1/6, 1/8. Botanical Cases, japanned, double tin, 1/6 to 4/6. Botanical Paper, 1/1, 1/4, 1/9, 2/2 per quire. Insect Glazed Cases, 2/6 to 11/-. Cement for replacing Antennæ 4d. per bottle. Steel Forceps, 1/6, 2/-, 2/6 per pair. Cabinet Cork, 7 by 3½, best quality 1/6 per dozen sheets. Brass Chloroform Bottle, 2/6. Insect Lens, 1/- to 8/-. Glass-top and Glass-bottomed Boxes, from 1/- per dozen. Zinc Killing Box, 9d. to 1/-. Pupa Digger, in leather sheath, 1/9. Taxidermist's Companion, containing most necessary implements for skinning, 10/6. Scalpels, 1/3; Scissors, 2/- per pair; Eggdrills, 2d., 3d., 9d.; Blowpipes, 4d.; Artificial Eyes for Birds and Animals; Label-lists of British Butterflies, 2d.; ditto of Birds' Eggs, 2d., 3d., 6d.; ditto of Land and Fresh-water Shells, 2d.; Useful Books on Insects, Eggs, etc.

THE WAND TELESCOPE NET (An innovation in Butterfly Nets).

We beg to call your attention to our new Telescopic Handle for butterfly nets. It is made entirely in brass, and is light and strong, and, moreover, it can be shut up to carry in small compass. A very compact pattern, effecting great saving in weight and bulk.

Prices—2 joints, 8/6; 3 joints, 9/6; 4 joints, 10/6.

Complete with cane folding ring and bag. We shall be pleased to send on application.

SHOW ROOM FOR CABINETS

Of every description of INSECTS, BIRDS' EGGS, COINS, MICROSCOPICAL OBJECTS, FOSSILS, &c.

Catalogue (100 pages) sent on application, post free.

LARGE STOCK OF INSECTS AND BIRDS' EGGS (British, European, and Exotic.)

Birds, Mammals, etc., Preserved and Mounted by First-class Workmen.

Only
Address—**36, STRAND, LONDON, W.C.** (5 doors from Charing Cross)

OVA, LARVÆ, AND PUPÆ.

The Largest Breeder of Lepidoptera in the British Isles is

H. W. HEAD, Entomologist,
SCARBOROUGH.

Full List of Ova, Larvae, and Pupae, also Lepidoptera, Apparatus, Cabinets, etc., sent on application.

Many Rare British Species and Good Varieties for Sale.

Lantern Slides in Natural Colours.

LEPIDOPTERA & LARVÆ A SPECIALITY.

Photographed from life and true to Nature in every detail.

SLIDES OF BIRDS, WILD FLOWERS, &c.,

By same Colour Process.

LANTERN SLIDES MADE TO ORDER FROM ANY SPECIMEN OR COLOURED DRAWING.

**PHOTOS IN COLOUR OF LARVÆ, LIFE SIZE, ON IVORINE
TABLETS TO PIN IN THE CABINET.**

For List apply to—

CHARLES D. HEAD, 2, Mount Vernon, Dollymount, DUBLIN.

Melanism and Melanochroism in British Lepidoptera.

By J. W. TUTT, F.E.S.

Strongly bound in Cloth. Price 5s. net.

Some recent observations anent the phenomena of Melanism and Melanochroism in Lepidoptera, seem to suggest that little has been published on, and practically nothing known of, the subject. Few new facts, however, have recently been brought to light, no new constructive theories have been offered, and the superficial destructive criticism has been too hopelessly weak to be worth serious notice. The want of general information on the subject is painfully evident in the case of many of the younger students, who have only too evidently neither read nor digested the literature available on this absorbingly interesting subject.

CONTENTS.

Melanism and Melanochroism in Lepidoptera—Localisation of melanic forms—Leucochroism—Melanism in moist areas—Not found in high latitudes—Influence of humidity—Review of the meteorological conditions of Europe—Of the great central Alpine-Carpathian range—Of the great Central Plain—Of the Mediterranean area—Distribution of melanic forms—Melanism in its geographical aspects—Peculiar meteorological conditions of Western Scotland—Outline of meteorological and climatic conditions of British Isles—Influence of Gulf Stream—East wind—West of Ireland as a melanic centre—The Hebrides, Orkneys, and Shetlands—Comparison of south England and Highland forms of Lepidoptera—Melanism of the northern counties of England—Comparison of distribution of melanic forms with certain meteorological conditions—Melanism in Western Scandinavia—Lancashire and Yorkshire melanism—Opinions of Dobrée, Cockerell, Buchanan-White, Cooke, etc.—Cooke's views of "natural selection" criticised—Birchall and the influence of light—Chapman on darkening influence produced by excessive moisture—Influence of natural selection in producing protected races—Manufacturing areas—Smoke and humidity as melanism-producing factors—Influence of wooded tracts on rainfall—On shutting out light—Melanism in Derbyshire—Sheldon's suggestions as to growth of melanic forms in that county—Porritt on melanism of *Boarmia repandata*—Cooke on *Tephrosia crepuscularia*, *T. biundularia*, and *Amphidasys betularia*—White's criticisms—Melanism in trunk-frequenting species—Melanism at Huddersfield and Sheffield—Edleston on *Amphidasys betularia*—Dampness in woods as affecting production of dark forms—Chapman on *Diurnea fagella*—London smoke—Deficiency of light as a possible factor—Races of *Hypsipetes sordidata*—Influence of wet season of 1888 on lepidoptera—Connection between rainfall and variation in New Zealand—Ground-resting species—Influence of natural selection—Variation of *Gnophos obscurata* and *Boarmia repandata* according to habits and habitat—Variation of *Bryophila perla*, *B. muralis*, etc.—Variation of marsh-frequenting lepidoptera—Resting-habits of butterflies—Criticism of superficial comparisons—Variation of *Polia chi* and *Aplecta nebulosa*—Supposed influence of low temperature—Weismann's temperature experiments—Merrifield's temperature experiments—Suggestions on some of the results—Climatic races in warm countries—Walsingham's address on melanism—Criticism thereof—Peculiar views of Dale on geology, meteorology, etc.—Cold as a factor of melanism—Heredity effects when melanic races are started—Merrifield's further experiments on *Ennomos autumnaria* and *Selenia illustriaria*—Forcing pupæ and results—Dimorphic seasonal forms in butterflies and moths—Cockerell's views thereon—Larval and pupal development—Seasonal forms in British species considered, e.g., *Pieris rapae*, *P. napi*, *Tephrosia bistortata* (*crepuscularia*), *Selenia illustriaria*, *S. illumaria*—Merrifield's views connecting heredity and the development of seasonal dimorphism—Atavic (reversional) and progressive developmental forms—Progressive development and partial melanism—The variation of Larentiid or "carpet moths"—Resting-habit of Larentiid moths—Melanism due to reversion—Tendency of certain cripples and ill-nurtured lepidoptera to melanism—Disease as a factor in producing melanism—Melanism *versus* suffusion—Walsingham's later views—Influence of light discussed—Criticism of views that light influences melanic development—Decrease of moisture producing paler races—Smith on results in New Zealand apparently produced by difference of rainfall—Smith's criticism of Walsingham's remarks on melanism—The theory outlined supported by observations on New Zealand lepidoptera—Phytophagic influences discussed—Plant foods—Size, variation, and food—Correlation of constitutional differences and the colour of animals—Views of Birchall and Wallace criticised—Influence of surroundings on optic sense of adult insects—Criticism thereof—Various superficial statements as to causes of melanism by Cooke, Prest, Robinson, etc., stated and criticised—Larval stage influenced by various conditions that affect resultant imago—Physiological factors bearing on melanism—Cockerell's theory as to combination influence of moisture + some (unknown) melanism-producing factor—Chapman's theory illustrated diagrammatically—Suitability of races to various climatic conditions—Suitable races acted on by natural selection.

Postal Order to—J. HERBERT TUTT, 22, Francemary Road, Brockley, S.E.



THE
ENTOMOLOGIST'S RECORD
AND
JOURNAL OF VARIATION
EDITED BY
J. W. TUTT, F.E.S.

ASSISTED BY

T. HUDSON BEARE, B.SC., F.E.S., F.R.S.E.
M. BURR, B.A., F.Z.S., F.L.S., F.E.S. T. A. CHAPMAN, M.D., F.Z.S., F.E.S.
H. ST. J. K. DONISTHORPE, F.Z.S., F.E.S.
JAS. E. COLLIN, F.E.S.

APRIL 15th, 1908.

Price SIXPENCE (NET).

WITH TWO PLATES.)

Subscription for Complete Volume, post free
(Including all DOUBLE NUMBERS, etc.)

SEVEN SHILLINGS,

TO BE FORWARDED TO

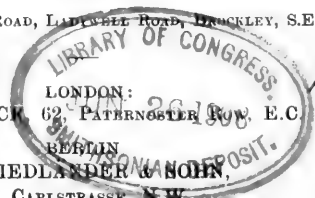
J. HERBERT TUTT,

22, FRANCEMARY ROAD, LADYBEL ROAD, BRICKLEY, S.E.

LONDON:
ELLIOT STOCK, 62, PATERNOSTER ROW, E.C.

BERLIN:
R. FRIEDLANDER & SOHN,

11, CARLSTRASSE, N.W.



GRESHAM LIFE OFFICE.

Founded 1848.

Assets, £9,500,000.

NEW FEATURE.

Endowment Assurance Policy,
WITH CESSATION OF PREMIUMS
DURING INCAPACITY
(Temporary or Permanent.)

VERY MODERATE PREMIUMS.

Head Office—ST. MILDRED'S HOUSE, POULTRY, LONDON, E.C.

JAMES H. SCOTT, *General Manager and Secretary.*

THE GRESHAM LIFE ASSURANCE SOCIETY, LIMITED.

D. F. TAYLER & Co., Ltd., **Entomological Pin Manufacturers,**

SMALL HEADS AND PERFECT POINTS. WHITE, BLACK, AND GILT.

BIRMINGHAM and LONDON.

Can be obtained from Dealers throughout the World.

NEW FOREST BUTTERFLIES & MOTHS

Ova, Larvæ, Pupæ, and (bred) Imagines supplied to order by

G. TATE and SON,

Entomologists, Lyndhurst, New Forest.

Established 1870.

Instructions given in Practical Entomology. Correspondence invited.

LABELS ! LABELS !! LABELS !!!

It is very essential that every specimen, to be authentic, should bear a minute label, giving locality, date of capture, and name of captor.

3000	{	To comprise equal numbers of not more than ten localities.	}	5/-
		Larger quantities <i>pro rato</i> . Orders executed in same order as received. Remittance in full must accompany each order.		
		Rannoch 16. vi. 97	New Forest 4. ix. 97	Shetland 5. v. 97

ADDRESS.—“Requisites,” Coombe Lodge, Mycenæ Road,
Westcombe Park, S.E.

Breeding Nets.

Wire frame bow-shaped nets, to slip on 5-inch and 8-inch flower-pots or saucers, open both ends. Useful for rearing larvæ on growing plants. Fold flat when not in use. 10in. by 9in., 9d.; 15in. by 12in., 1s. 6d. Also light pocket lamp-post nets, 2s., carriage paid.

S. W. GADGE, 68, Chestnut Grove, Balham.

A FRIENDLY RECOMMENDATION,

if you are feeling run down, or out of sorts, or suffer from a disordered state of the Liver, Kidneys, Stomach, or Bowels, would be to take a well-tryed remedy. It would not be kindness to ask you to risk an experimental one. BEECHAM'S PILLS have a world-wide reputation, and sell by millions of boxes every year, and are every day maintaining tens of thousands of people in perfect health. The advice of these people would be to

TAKE

BEECHAM'S PILLS

for Sick-Headache, Indigestion, Poorness of Blood, Constipation, Biliousness, and Debility of the Nervous System. They give very speedy results, and quickly correct the irregularities that are causing you so much pain and anxiety. BEECHAM'S PILLS are composed entirely of medicinal herbs, and are warranted free from mercury or other substances. They can harm no one, and may be given to children, or to the aged and infirm, with perfect safety. It will be to your interest to do as many others are doing with such great advantage to themselves. Begin to take BEECHAM'S PILLS at once.

Prepared only by THOMAS BEECHAM, St. Helens, Lancs.

Sold everywhere in boxes, price 1/1½ (56 pills) & 2/9 (168 pills.)

Subscriptions for Vol. XX (7 shillings) are now overdue, and should be sent without delay (and so save time and correspondence) to J. Herbert Tutt, 22, Francemary Road, Ladywell Road, Brockley, S.E. Will subscribers please oblige? [This subscription includes all numbers published from January 15th to December 15th, 1908.]

Non-receipt or errors in the sending of Subscribers' magazines should be notified to Mr. H. E. Page, "Bertrose," Gellatly Road, Hatcham, S.E.

NOTICE.

The Back Volumes (I-XIX) of *The Entomologist's Record*, &c., can be obtained at 10s. 6d. per Volume. Complete set of 18 vols. £6 13s. 6d. net. "Special Index" to Vols. III., IV., V., VI., VII., VIII., IX., X., XI., XII., XIII., XIV., XV., XVI., XVII., XVIII. and XIX., are sold separately, price 1/6 each. Single Back Numbers can be obtained at double the published price from 119, Westcombe Hill, Blackheath, S.E.

Subscribers are kindly requested to observe that subscriptions to *The Entomologist's Record*, &c., are payable in advance. The subscription (with or without the Special Index) is Seven Shillings, and must be sent to Mr. J. Herbert Tutt, 22, Francemary Road, Ladywell Road, Brockley, S.E. Cheques and Postal Orders should be made payable to J. W. TUTT.

ADVERTISEMENTS of Books and Insects for Sale will be inserted at a minimum charge of 2s. 6d. (for four lines). Longer Advertisements in proportion. A reduction made for a series. Particulars of Mr. J. Herbert Tutt, 22, Francemary Road, Ladywell Road, Brockley, S.E.

Subscribers who change their addresses must report the same to Mr. H. E. PAGE, "Bertrose," Gellatly Road, St. Catherine's Park, London, S.E., otherwise their magazines will probably be delayed, also to Mr. J. HERBERT TUTT, 22, Francemary Road, Ladywell Road, Brockley, S.E.

Articles for insertion and Exchanges should be sent to J. W. TUTT, Rayleigh Villa, Westcombe Hill, S.E., except notes relating to Coleoptera, which should be sent to Mr. H. DONISTHORPE, 58, Kensington Mansions, South Kensington, S.W., and of Orthoptera, to Mr. BARR, Sibertswood, near Dover.

Articles that require Illustration are inserted on condition that the author defrays the cost of the illustrations.

All Exchange Magazines must be forwarded to J. W. TUTT, Rayleigh Villa, Westcombe Hill Blackheath, S.E.

EXCHANGES.—The use of this column for the offer of "Duplicates" and "Desiderata" and Berkhamstead.

Duplicates.—Complanella, Emberizæpennella, Coryli, Bremiella, Alnifoliella, Solitariella, Salicicolella, Spinolella, Lautella, Carpinicolella, Semidecandriella, Marginea, Pomifoliella, Cramerella, Maritima, Sylvestra, Miscella, Stettinensis, Lantanella, Pfeifferella, For any specimens useful in my cabinets. Will send marked list.—J. A. Clark, 57, Weston Park, Crouch End, N.

Duplicates.—Larvæ of Versicolor (from wild Scotch parents), *O. autumnata* (very dark); ova of dark, heavily-marked *Flavicornis*, *Bistortata*, *Tristata*, *Liturata*, var. *nigrofulvata*. Wanted for experimental purposes ova of *Hispidaria*, *Lapponaria*, *Populeti*, larvæ of *Filigrammaria*, *Ashworthii*.—*J. W. H. Harrison*, 181, Abingdon Road, Middlesbro'.

WANTED.—Good photographs or careful drawings of Aberrations, Gynandromorphs, etc., of any British "Blues," for reproduction in *The Natural History of the British Butterflies*. Also photos and good drawings of Aberrations and Gynandromorphs of other groups that may be used later as opportunity offers. [Specimens not necessarily British.] *J. W. Tutt*, 119, Westcombe Hill, Blackheath.

CHANGE OF ADDRESS.—*Mr. L. A. Raywood* to 3. Albert Mansions, Lansdowne Road, Croydon.

MEETINGS OF SOCIETIES.

Entomological Society of London.—11, Chandos Street, Cavendish Square, W., 8 p.m. Meetings—May 6th, June 3rd, October 7th, 21st, November 4th, 18th, December 2nd.

The City of London Entomological and Natural History Society.—London Institution, Finsbury Circus, E.C.—The first and third Tuesdays in the month, at 7.30 p.m., except in July and August. April 21st, Special Exhibition—"The *Agrotis tritici* group." May 5th, "Notes on Canadian Lepidoptera," *Mr. L. B. Prout*, F.E.S.

Toynbee Hall Natural History Society.—Held at Toynbee Hall, Commercial Street, E., Mondays, at 8 p.m.—May 4th, Exhibition. Excursions—May 3rd, Bookham (from Waterloo, 10.5 a.m.); May 16th, Hayes (from London Bridge, 2.30 p.m.).

The South London Entomological and Natural History Society, Hibernia Chambers, London Bridge.—The second and fourth Thursdays in each month, at 8 p.m. April 25th, May 14th, 28th.

North London Natural History Society, The Amherst Club, Amhurst Road, N. (No notices).

Lancashire and Cheshire Entomological Society.—Meetings at the Royal Institution, Liverpool, on the 3rd Monday in the month from October to April. Hon. Sec., H. R. Sweeting, 6, The Elms, Dingle, Liverpool.

Birmingham Entomological Society, at the rooms of the Birmingham Nat. Hist. and Philosophic Society, Avebury House, 55, Newball Street, at 8 p.m.

NOTES ON THE ZYGÆNIDÆ.

By **J. W. TUTT, F.E.S.**

Price **ONE SHILLING and SIXPENCE.**

(('containing an account of the newly-discovered British species.)

- Chapter I.—*Zygaena exulans* and its varieties.
- Chapter II.—*Zygaena carniolica* and its varieties.
- Chapter III.—*Zygaena achilleae* and its varieties.
- Chapter IV.—*Zygaena transalpina* and its varieties.
- Chapter V.—*Zygaena medicaginis* and its varieties.
- Chapter VI.—*Zygaena ochsenheimeri*.

A few copies only in stock.

Postal Orders to—**A. H., 41, WISTERIA ROAD, LEWISHAM, S.E.**

Melanism and Melanochroism in British Lepidoptera

(Demy 8vo., bound in Cloth. Price 5/-.)

Deals exhaustively with all the views brought forward by scientists to account for the forms of melanism and melanochroism; contains full data respecting the distribution of melanic forms in Britain, and theories to account for their origin; the special value of "natural selection," "environment," "heredity," "disease," "temperature," &c., in particular cases. Lord Walsingham, in his Presidential address to the Fellows of the Entomological Society of London, says, "An especially interesting line of enquiry as connected with the use and value of colour in insects is that which has been followed up in *Mr. Tutt's* series of papers on 'Melanism and Melanochroism.'"

J. HERBERT TUTT, 22, Francemary Road, Ladywell Road, Brockley, S.E.

NEW EDITION

. . . . OF

Practical Hints for the Field Lepidopterist.

(Interleaved for Collector's own notes.)

PART I.

By **J. W. TUTT, F.E.S.**

is in the Printer's hands. It will contain, in addition to the "Contents" of the 1st edition, full, detailed, and technical Chapters, as suitable for experts as beginners on—"The Collection and Conservation of Lepidoptera," "Killing," "Pinning," "Entomological Pins," "Setting," and "Labelling." These are not merely instructions to beginners, but technical and thoroughly well-suited for advanced lepidopterists. Although so much enlarged the price of the second edition of Part I will be exactly the same as for the 1st edition, *viz.*, **6s. net.** Supporters of the 1st edition should support the new and enlarged edition.

. . A COMPLETE SET OF . .

Practical Hints for the Field Lepidopterist

PARTS I II & III

can now be supplied

Price 6s. net or 17s. 6d. for the three parts.

This is the first occasion for the last 4 years in which it has been possible to offer a complete set at the published price.

The success of this work among field-lepidopterists has been that Part I has for some years been quite out of print, and it has become necessary to reprint the same. This has now been done in a much enlarged form. The three Parts contain—

- (1) Above 3000 "Practical Hints" of the form so well-known.
- (2) Technical chapters on "The Collecting and Conservation of Lepidoptera," "Killing," "Pinning," "Entomological pins," "Setting," and "Labelling," also
- (3) Chapters on "Preservation," "Mounting," and "Photographing of Eggs," as well as
- (4) Chapters on "Collections," "Collecting," "the Egg and Egg-stage," "the Larva and Larval stage," "the Pupa and Pupal stage" (with model descriptions and hints for useful records).
- (5) Illustrated by carefully executed plates, and with a
- (6) Specific Index to Parts I, II, and III, and containing references to some 1600 British species.

The whole comprising the most important book on the subject ever offered to the field lepidopterist, and a complete Encyclopædia of Field Lepidopterology.

Orders for the New Volume are solicited from old subscribers, and from new ones who want a thorough help in their field researches.

DEAR SIR,—Please forward me a copy of the new *Practical Hints*, Part I., for which I enclose Postal Order for **6s.**

Name

Address

DEAR SIR,—Please forward me a set of *Practical Hints*, Parts I, II, and III, for which I enclose Postal Order for **17s. 6d.**

Name

Address

To **Mr. J. HERBERT TUTT, 22, Francemary Road, Ladywell Road, Brockley, S.E.**

TEMPORARY OFFER.

REDUCTION IN PRICE.

. . . A . . .

NATURAL HISTORY OF THE BRITISH BUTTERFLIES

By J. W. TUTT, F.E.S.

Vols. I and II.

(Bound in Cloth, complete.)

The nearness of the completion of *Vol. II* of this important work, leads us to make the following offer, *which will be withdrawn as soon as Vol. II is officially published*, when the standard net price of £1 per volume will be insisted upon as hitherto, *viz.*, **The two vols. will be forwarded for £1 12s. 6d.—Vol. I to be sent at once and Vol. II as soon as published.**

It is hoped to have this volume in the binder's hands before the publication of this number of the Ent. Record is published.

In spite of the apparent dearness of this work, it is in reality the *cheapest ever published*. Each volume averages more than 500 pages of solid Long Primer and Brevier, of demy 8vo. size; all the contents consisting of summarised detail, and without any superfluous padding. It is a book for students, who really want *all the available information on the subject* dealt with. It is the standard work in use among *all the best scientific lepidopterists on the continent* as well as in the British Islands, and is possibly more often referred to by workers on the *Palaeartic fauna* than any other book in existence. It covers all the Continental work ever done on the groups treated, and not only gives the facts, but informs the student how to get at everything published on the subject he is reading.

The *illustrations* of these two volumes are quite unequalled. There are, in the volume now being published, *full-page life-histories of each species*, and detailed structural plates of egg, larvæ and larval hairs, spiracles, etc., pupæ and pupal hairs, spiracles, etc., and other items illustrating quite new discoveries in the structure of the early stages, etc.

The series of volumes forms indeed a standard work of reference, and any lepidopterist who possesses the volumes wants rarely to make reference to outside libraries for any detail, however unusual, on the subjects treated.

The general chapters, too, are summaries of everything known and published on the various subjects. The preliminary chapters, also, introducing each superfamily, covers the world-wide literature, and questions of classification and systematic entomology are discussed from the broad standpoint of the fauna of the world, and not from any restricted or limited point of view. The work, therefore, is one that appeals to all lepidopterists.

This offer can only be considered by being made directly to Mr. J. H. TUTT. **Single volumes can only be supplied at £1 net.**

DEAR SIR,—

Please forward me Vol. I of *The Natural History of British Butterflies* at once, and Vol. II as soon as published, for which I send herewith Cheque (or Postal Order) for £1 12s. 6d.

Name.....

Address.....

Date.....

Mr. J. HERBERT TUTT,

22, Francemary Road, Ladywell Road, Brockley, S.E.

WATKINS & DONCASTER,

Naturalists and Manufacturers of Entomological Apparatus and Cabinets.

Plain Ring Nets, wire or cane, including Stick, 1/3, 2/-, 2/6. Folding Nets, 3/6, 4/-.
Umbrella Nets (self-acting), 7/-. Pocket Boxes, 6d., 9d., 1/-, 1/6. Zinc Relaxing Boxes,
9d., 1/-, 1/6, 2/-. Nested Chip Boxes, 7d. per four dozen. Entomological Pins, assorted
or mixed, 1/-, 1/6 per ounce. Pocket Lanterns, 2/6 to 3/-. Sugaring Tin, with brush, 1/6,
2/-. Sugaring Mixture, ready for use, 1/9 per tin. Store-Boxes, with canphor cells, 2/6,
4/-, 5/-, 6/-. Setting-Boards, flat or oval, lin., 6d.; 1½ in., 8d.; 2 in., 10d.; 2½ in., 1/-;
3½ in., 1/4; 4 in., 1/6; 5 in., 1/10; Complete Set of fourteen Boards, 10/6. Setting Houses,
9/6, 11/6; corked back, 14/-. Zinc Larva Boxes, 9d., 1/-, 1/6. Breeding Cage, 2/6, 4/-,
5/-, 7/6. Coleopterist's Collecting Bottle, with tube, 1/6, 1/8. Botanical Cases, japanned,
double tin, 1/6 to 4/6. Botanical Paper, 1/1, 1/4, 1/9, 2/2 per quire. Insect Glazed Cases,
2/6 to 11/-. Cement for replacing Antennæ 4d. per bottle. Steel Forceps, 1/6, 2/-, 2/6 per
pair. Cabinet Cork, 7 by 3½, best quality 1/6 per dozen sheets. Brass Chloroform Bottle,
2/6. Insect Lens, 1/- to 8/-. Glass-top and Glass-bottomed Boxes, from 1/- per dozen.
Zinc Killing Box, 9d. to 1/-. Pupa Digger, in leather sheath, 1/9. Taxidermist's Com-
panion, containing most necessary implements for skinning, 10/6. Scalpels, 1/3; Scissors,
2/- per pair; Eggdrills, 2d., 3d., 9d.; Blowpipes, 4d.; Artificial Eyes for Birds and
Animals; Label-lists of British Butterflies, 2d.; ditto of Birds' Eggs, 2d., 3d., 6d.; ditto
of Land and Fresh-water Shells, 2d.; Useful Books on Insects, Eggs, etc.

THE WAND TELESCOPE NET (An innovation in Butterfly Nets).

We beg to call your attention to our new Telescopic Handle for butterfly nets. It is
made entirely in brass, and is light and strong, and, moreover, it can be shut up to carry
in small compass. A very compact pattern, effecting great saving in weight and bulk.

Prices—2 joints, 8/6; 3 joints, 9/6; 4 joints, 10/6.

Complete with cane folding ring and bag. We shall be pleased to send on application.

SHOW ROOM FOR CABINETS

Of every description of INSECTS, BIRDS' EGGS, COINS, MICROSCOPICAL OBJECTS, FOSSILS, &c.

Catalogue (100 pages) sent on application, post free.

LARGE STOCK OF INSECTS AND BIRDS' EGGS (British, European, and Exotic.)

Birds, Mammals, etc., Preserved and Mounted by First-class Workmen.

Only
Address—**36, STRAND, LONDON, W.C. (5 doors from Charing Cross)**

OVA, LARVÆ, AND PUPÆ.

The Largest Breeder of Lepidoptera in the British Isles is

H. W. HEAD, Entomologist,
SCARBOROUGH.

Full List of Ova, Larvae, and Pupae, also Lepidoptera, Apparatus, Cabinets,
etc., sent on application.

Many Rare British Species and Good Varieties for Sale.

Lantern Slides in Natural Colours.

LEPIDOPTERA & LARVÆ A SPECIALITY.

Photographed from life and true to Nature in every detail.

SLIDES OF BIRDS, WILD FLOWERS, &c.,

By same Colour Process.

LANTERN SLIDES MADE TO ORDER FROM ANY SPECIMEN OR COLOURED DRAWING.

**PHOTOS IN COLOUR OF LARVÆ, LIFE SIZE, ON IVORINE
TABLETS TO PIN IN THE CABINET.**

For List apply to—

CHARLES D. HEAD, 2, Mount Vernon, Dollymount, DUBLIN.

The Migration and Dispersal of Insects.

By J. W. TUTT, F.E.S.

(Demy 8vo. 132 pages. 5s. net.)

Chapter I: GENERAL CONSIDERATIONS.—Movements of insects—Irregular dispersal movements—Power of flight—At sea—Means of dispersal—Wallace's views—Importation—Limitations—Foodplant—Climate—Unsuitability—Adaptation—Antiquity—Fossil insects—Ancient and recent elements of faunas.

Chapter II: COCCIDS AND APHIDES.—Characters—Distribution—Sedentary habits—Immense distances spread—Means of distribution—Local movements—Of Pemphigians—*Phylloxera vastatrix*—General movements of Aphides—Reproduction—Parthenogenesis—Blight—Drowned hordes—Migration and ants—Other migrating Hemiptera.

Chapter III: ORTHOPTERA.—Migratory "locusts"—Size of flights—Influence of food—Antiquity—Irrregularity of invasions—Direction—Migration of larval forms—"Voetgangers"—Winged forms at sea—Locusts common to Old and New Worlds—Migratory locusts of the Old World—Migrations over Britain—1842 to 1876—Flights in Asia and Africa—Algerian swarms—Devastations during last 1000 years—Locust years of 19th century—Migrations in America—Report of the U.S. commission—Favourable conditions—Height reached by swarms—Night movements—"Voetgangers" in N. America—Direction—S. American migratory species—Depredations in Chili and Argentina—in S. Africa—in Australia—Darwin's observations—Migration of Gryllids—of Cockroaches—Origin of movements—Destruction of immigrants—Connection between migratory instinct of this and other orders.

Chapter IV: ODONATA.—Migrating European dragonflies—At sea—1761 migration—Observations—The 1852 migration—Immense distribution—Libellulids common to Palæarctic and Nearctic regions—Migrations of *L. quadrimaculata* in Sweden, at Shoeburyness, Dover, Heligoland—Details of 1839 swarm—Probable cause—Swarms of *Anax mediteraneus*, *Æschna mixta*, *Æ. grandis*—Alpine swarms—Swarm drowned in Mediterranean—Distribution of *Pantala flavescens* and *Tholymis tillarga*—Appearance in the China Sea—*Anax ephippiger* at sea—Movements of *Æschna bonariensis*—*Libellula quadrimaculata* in Wisconsin—Summary of migrations—Hagen on 1852 flight—Sedentary species—British immigrants—Casuals or suspects—Possible causes—Origin of instinct.

Chapter V: LEPIDOPTERA.—Migration of—Swarm in 1104—General movement since Glacial Epoch—Weak-winged migrants—*Deiopeia pulchella* at sea—*Plusia gamma* at sea—Other records from sea—Mediterranean flights—Flights off coast South America—*Agrius convolvuli*, *Manduca atropos*, *Euvanessa antiopa*, *Anosia archippus*, *Hypolimnas misippus*, etc., at sea—Migrant Hawk moths—*Deilephila gallii* in Britain—*Plusia gamma*—Old records—Lighthouse records—Migration of Hybernias—Heligoland lepidoptera—Night movements—Lighthouse reports—Butterflies at night—Lighthouse visits—Darwin on *Colias*—*Colias edusa* and *C. hyale* as British immigrants, 1804-1890—Extermination of progeny—Unsuitable environment—Appearances of *Pyrameis cardui* and *Plusia gamma*—*P. cardui* from 1741 to 1899—Migration of 1879—Course—Mediterranean habits—*P. cardui* in N. America—*Anosia archippus*—Criticism—So-called return swarms—Congregating habit—Details of records—*A. archippus* in Old World—Visits to Britain—Colonisation by—*Pieris daphidice*, *Argynnis lathonia*, *Euvanessa antiopa* as migrants—*Pieris brassicae*, *P. rapae*, *P. napi*, etc., at sea—Settling on water—Migration of Pierids in India, etc.—Cingalese flights—The Indian Euploëas—Summary of Piepers' paper on migration of East Indian species—Criticism—Callidryads of America—Africa—Trimen on butterflies at sea—Migration of *Eurema lisa*—*Pieris monuste*—Belt on migration in Nicaragua—The Uranias—American Vanessids—Migrants and direction—At great elevations—Swarming and migration of Apaturids—Butterfly migration in Australia and the Pacific Islands, etc.

Chapter VI: COLEOPTERA.—Migration of beetles—Calosomas—*Carabus vulgaris*—*Galeruca* massing on sea-shore—Immigrants in Argentine—Swarms in Australia—North America—Dispersal of aquatic beetles—Darwin's observations—Observations on Ben Nevis—Elevations reached by lowland forms—Influence of air currents—Beetles flying out to sea—Arizona swarm—*Melolontha vulgaris*—Ancient records—Migrating Coccinellids—Fabre on dispersal habits—*Hippodamia lecontei*, *Cantharis nuttallii*, *Lytta vesicatoria*, *Apion vernalis*—*Ateuchus sacer* and *A. laticollis* crossing Mediterranean.

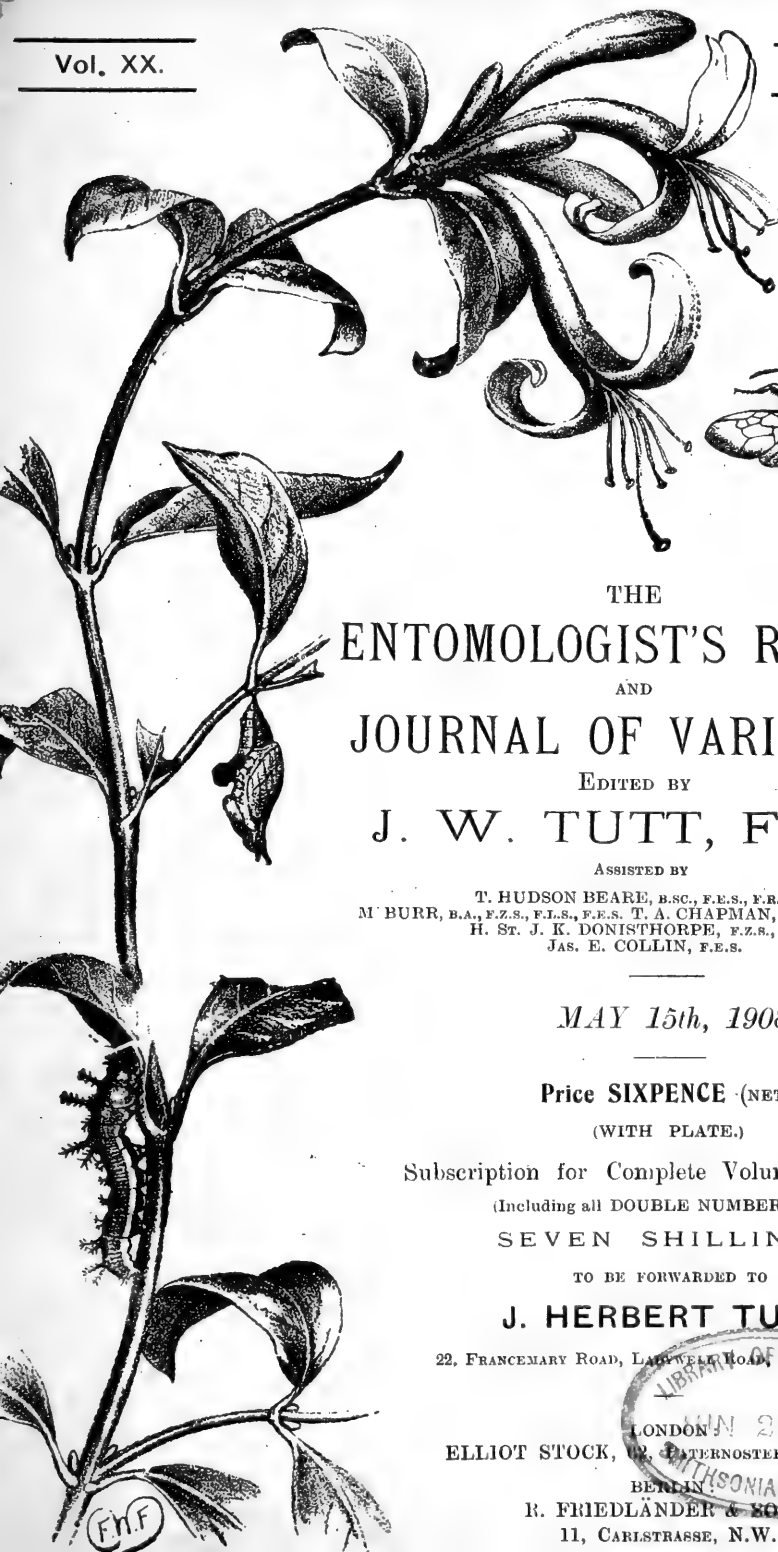
Chapter VII: DIPTERA.—Flies at sea—*Bibio* migrations—Swarming *Syrphidae*—Syrphids destroyed at sea—Culicids in New Zealand—Tipulids—Culicids in Ireland, England, etc.—Swarms of Culicids—*Chironomus*—Mosquito night—*Chironomus lugubris* in Germany—in the Netherlands—*Chlorops*—Distribution of *Eristalis tenax*, *Musca vomitoria*, *Merodon equestris*—Distribution of Hessian fly.

Chapter VIII: SOCIAL INSECTS, HYMENOPTERA, TERMITES.—*Athalia centifolia*—Sphegids—Bees at night—Lighthouse reports—*Ammophila hirsuta*—*Polistes bipustulatus*, etc., in Britain—Dispersal movements of *Apis mellifica*—of *Trigona* mosquito, etc.—Migration swarms of ants—Dead ants at sea—American records—New Zealand—Brazil—Pseudo-swarms—True "swarms"—Dispersal of Termites, etc.

Chapter IX: FINAL CONSIDERATIONS.—Summary of facts and conclusions—Probable causes of insect dispersion, its origin, and results.

Vol. XX.

No. 5.



THE
ENTOMOLOGIST'S RECORD
AND
JOURNAL OF VARIATION
EDITED BY
J. W. TUTT, F.E.S.

ASSISTED BY

T. HUDSON BEARE, B.SC., F.E.S., F.R.S.E.
M. BURR, B.A., F.Z.S., F.L.S., F.E.S. T. A. CHAPMAN, M.D., F.Z.S., F.E.S.
H. ST. J. K. DONISTHORPE, F.Z.S., F.E.S.
JAS. E. COLLIN, F.E.S.

MAY 15th, 1908.

Price SIXPENCE (NET).

(WITH PLATE.)

Subscription for Complete Volume, post free
(Including all DOUBLE NUMBERS, etc.)

SEVEN SHILLINGS,

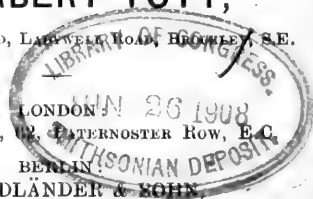
TO BE FORWARDED TO

J. HERBERT TUTT,

22, FRANCIS ROAD, LAMBETH ROAD, LONDON, S.E.

ELLIOT STOCK, 12, PATERNOSTER ROW, E.C.

R. FRIEDLÄNDER & SOHN,
11, CARLSTRASSE, N.W.



GRESHAM LIFE OFFICE.

Founded 1848.

Assets, £9,500,000.

NEW FEATURE.

**Endowment Assurance Policy,
WITH CESSATION OF PREMIUMS
DURING INCAPACITY**
(Temporary or Permanent.)

VERY MODERATE PREMIUMS.

Head Office—ST. MILDRED'S HOUSE, POULTRY, LONDON, E.C.

JAMES H. SCOTT, *General Manager and Secretary.*

THE GRESHAM LIFE ASSURANCE SOCIETY, LIMITED.

D. F. TAYLER & Co., Ltd., Entomological Pin Manufacturers,

SMALL HEADS AND PERFECT POINTS. WHITE, BLACK, AND GILT.

BIRMINGHAM and LONDON.

Can be obtained from Dealers throughout the World.

NEW FOREST BUTTERFLIES & MOTHS

Ova, Larvæ, Pupæ, and (bred) Imagines supplied to order by

G. TATE and SON,
Entomologists, Lyndhurst, New Forest.

Established 1870.

Instructions given in Practical Entomology. Correspondence invited.

LABELS ! LABELS !! LABELS !!!

It is very essential that every specimen, to be authentic, should bear a minute label, giving locality, date of capture, and name of captor.

3000	{	To comprise equal numbers of not more than ten localities.	}	5/-
		Larger quantities <i>pro rata</i> . Orders executed in same order as received. Remittance in full must accompany each order.		
		Rannoch 16. vi. 97	New Forest 4. ix. 97	Shetland 5. v. 97

ADDRESS.—“Requisites,” Coombe Lodge, Mycenæ Road,
Westcombe Park, S.E.

Melanism and Melanochroism in British Lepidoptera

(Demy 8vo., bound in Cloth. Price 5/-.)

Deals exhaustively with all the views brought forward by scientists to account for the forms of melanism and melanochroism; contains full data respecting the distribution of melanic forms in Britain, and theories to account for their origin; the special value of “natural selection,” “environment,” “heredity,” “disease,” “temperature,” &c., in particular cases. Lord Walsingham, in his Presidential address to the Fellows of the Entomological Society of London, says, “An especially interesting line of enquiry as connected with the use and value of colour in insects is that which has been followed up in Mr. Tutt's series of papers on ‘Melanism and Melanochroism.’”

J. HERBERT TUTT, 22, Francemary Road, Ladywell Road, Brockley, S.E.

A FRIENDLY RECOMMENDATION,

if you are feeling run down, or out of sorts, or suffer from a disordered state of the Liver, Kidneys, Stomach, or Bowels, would be to take a well-tryed remedy. It would not be kindness to ask you to risk an experimental one. BEECHAM'S PILLS have a world-wide reputation, and sell by millions of boxes every year, and are every day maintaining tens of thousands of people in perfect health. The advice of these people would be to

TAKE

BEECHAM'S PILLS

for Sick Headache, Indigestion, Poorness of Blood, Constipation, Biliousness, and Debility of the Nervous System. They give very speedy results, and quickly correct the irregularities that are causing you so much pain and anxiety. BEECHAM'S PILLS are composed entirely of medicinal herbs, and are warranted free from mercury or other substances. They can harm no one, and may be given to children, or to the aged and infirm, with perfect safety. It will be to your interest to do as many others are doing with such great advantage to themselves. Begin to take BEECHAM'S PILLS at once.

Prepared only by **THOMAS BEECHAM**, St. Helens, Lancs.

Sold everywhere in boxes, price 1/1½ (56 pills) & 2/9 (168 pills.)

Subscriptions for Vol. XX (7 shillings) are now overdue, and should be sent without delay (and so save time and correspondence) to **J. Herbert Tutt, 22, Francemary Road, Ladywell Road, Brockley, S.E.** Will subscribers please oblige? [This subscription includes all numbers published from January 15th to December 15th, 1908.]

Non-receipt or errors in the sending of Subscribers' magazines should be notified to **Mr. H. E. Page, "Bertrose," Gellatly Road, Hatcham, S.E.**

NOTICE.

The **Back Volumes** (I-XIX) of *The Entomologist's Record*, &c., can be obtained at 10s. 6d. per Volume. Complete set of 19 vols. £6 13s. 6d. net. "**Special Index**" to Vols. III., IV., V., VI., VII., VIII., IX., X., XI., XII., XIII., XIV., XV., XVI., XVII., XVIII. and XIX., are sold separately, price 1/6 each. **Single Back Numbers** can be obtained at double the published price from **119, Westcombe Hill, Blackheath, S.E.**

Subscribers are kindly requested to observe that subscriptions to *The Entomologist's Record*, &c., are payable in advance. The subscription (with or without the Special Index) is **Seven Shillings**, and must be sent to **Mr. J. Herbert Tutt, 22, Francemary Road, Ladywell Road, Brockley, S.E.** Cheques and Postal Orders should be made payable to **J. W. Tutt.**

ADVERTISEMENTS of **Books and Insects for Sale** will be inserted at a minimum charge of 2s. 6d. (for four lines). Longer Advertisements in proportion. A reduction made for a series. Particulars of **Mr. J. Herbert Tutt, 22, Francemary Road, Ladywell Road, Brockley, S.E.**

Subscribers who **change their addresses** must report the same to **Mr. H. E. PAGE, "Bertrose," Gellatly Road, St. Catherine's Park, London, S.E.,** otherwise their magazines will probably be delayed, also to **Mr. J. HERBERT TUTT, 22, Francemary Road, Ladywell Road, Brockley, S.E.**

Articles for insertion and Exchanges should be sent to **J. W. TUTT, Rayleigh Villa, Westcombe Hill, S.E.,** except notes relating to Coleoptera, which should be sent to **Mr. H. DONISTHORPE, 58, Kensington Mansions, South Kensington, S.W.,** and of Orthoptera, to **Mr. BURR, Eastry S.O., Dover.**

Articles that require **Illustration** are inserted on condition that **the author** defrays the cost of the illustrations.

All **Exchange Magazines** must be forwarded to **J. W. TUTT, Rayleigh Villa, Westcombe Hill Blackheath, S.E.**

EXCHANGES.—*The use of this column for the offer of "Duplicates" and "Desiderata" and "Changes of Address" is open free to subscribers so long as space is available.*

Duplicates.—Complanella, Emberizæpennella, Coryli, Bremiella, Alnifoliella, Solitariella, Salicicolella, Spinolella, Lautella, Carpinicolella, Semidecandriella, Marginea, Pomifoliella, Cramerella, Maritima, Sylveilla, Miscella, Stettinensis, Lantanella, Pfeifferella, For any specimens useful in my cabinets. Will send marked list.—**J. A. Clark, 57, Weston Park, Crouch End, N.**

Duplicates.—Larvæ of *Versicolora* (from wild Scotch parents), *O. autumnata* (very dark); ova of dark, heavily-marked *Flavicornis*, *Bistortata*, *Tristata*, *Liturata* var. *nigrofulvata*. Wanted for experimental purposes ova of *Hispidaria*, *Lapponaria*, *Populeti*, larvæ of *Filigrammaria*, *Ashworthii*.—*J. W. H. Harrison, 181, Abingdon Road, Middlesbro'*.

Duplicates.—*Glandifera*, *Monacha**, *Craccæ* (fair), *Gracilis** (red New Forest forms), *Littoralis*, *Unigera*. *Desiderata*.—Pupæ of *Tiliæ* and *Ocellatus*.—*W. J. Ogden, 1, West Bank, Stamford Hill, London. W.*

Duplicates.—Larvæ of *W-Album*, *Cassinea*, *Straminea*, *Cespitis*, *Suavella*, *Galactodactyla*, *Pterodactyla* (*Fuscus*), *Septodactyla* (*Lienigianus*), and later *Phæodactyla*.—*J. Ovenden, Frindsbury Road, Strood, Kent.*

WANTED.—Indian *Theclas*, *Chrysophanids*, and *Lycænids*. Offered—*Palæarctic* and *Nearctic* species.—*J. W. H. Harrison, 181, Abingdon Road, Middlesboro'*.

WANTED.—Good photographs of careful drawings of Aberrations, *Gynandromorphs*, etc., of any British "Blues," for reproduction in *The Natural History of the British Butterflies*. Also photos and good drawings of Aberrations and *Gynandromorphs* of other groups that may be used later as opportunity offers. [Specimens not necessarily British.] *J. W. Tutt, 119, Westcombe Hill, Blackheath.*

CHANGES OF ADDRESS.—*Mr. G. C. Griffiths* to "*Penhurst*," *Leigh Road, Clifton, Bristol.* *Mr. A. Russell* to "*Wilverley*," *Dale Road, Purley.* *Mr. E. W. Lifton* to *17, Tweenbrook Avenue, Gloucester.* *Mr. G. T. Porritt* to *Elm Lea, Dalton, Huddersfield.*

MEETINGS OF SOCIETIES.

Entomological Society of London.—11, Chandos Street, Cavendish Square, W., 8 p.m. **May 15th.** at 8.30 p.m., *Conversazione*, etc. at Burlington Gardens. Tickets 2s. 6d.—from *H. Rowland-Brown, Oxhey Grove, Harrow Weald, Middlesex.* Meetings—June 3rd, October 7th, 21st, November 4th, 18th, December 2nd.

The City of London Entomological and Natural History Society.—London Institution, Finsbury Circus, E.C.—The first and third Tuesdays in the month, at 7.30 p.m., except in July and August.

Toynbee Hall Natural History Society.—Held at Toynbee Hall, Commercial Street, E., Mondays, at 8 p.m. **May 16th,** Hayes (from London Bridge, 2.30 p.m.).

The South London Entomological and Natural History Society, *Hibernia Chambers, London Bridge.*—The second and fourth Thursdays in each month, at 8 p.m. **May 14th,** "*Hungarian Butterflies*," *A. H. Jones,* **May 28th, 30th** (Field Meeting), **June 11th, June 20th** (Field Meeting).

Lancashire and Cheshire Entomological Society.—Meetings at the Royal Institution, Liverpool, on the 3rd Monday in the month from October to April. Hon. Sec., *H. R. Sweeting, 6, The Elms, Dingle, Liverpool.*

British Lepidoptera.

Mr. J. C. STEVENS begs to announce that the

COLLECTION OF LEPIDOPTERA

formed by the late Herbert Goss, Esq., will be offered for Sale by Auction on

Tuesday, June 2nd, at 1 o'clock,

and will include some remarkable varieties of

SIBYLLA, RHAMNI, PAPHIA, CIXIA, SELENE & FILIPENDULÆ.

Also many rare and some extinct species taken by himself.

CATALOGUES (in course of preparation) may be had on application to

The Auctioneer, 38, King Street, Covent Garden, W.C.

Natural History of the British Lepidoptera.

By J. W. TUTT, F.E.S.

Vol. IX.

Price £1 net.

Vol. IX of this Encyclopædic work has just been completed. It contains full and detailed accounts of the "Hairstreaks" and "Blue" butterflies, dealing in the most comprehensive manner with every phase of their life-history, variation, and distribution. The volume is divided into two sections, the General Chapters dealing with a variety of the phenomena attendant on the natural activities of butterfly larvæ; the second, the systematic description, biology and distribution of the species dealt with, and the discussion of the literature and characters of the families, subfamilies and genera to which the species belong, forming, as it were, a basis for the detailed consideration of the world-fauna.

There are now published.—Vols. I-V and VIII-IX, the seven volumes forming a complete monographic revision of the species dealt with.

To new subscribers to the whole work *the complete set of 7 volumes* will be forwarded direct for **£6**. (If ordered through the booksellers, the price is **£1 net each volume**. Only those who send their names to Mr. J. Herbert Tutt as continuous subscribers can be supplied at this price and application must be to him direct.)

In spite of the apparent dearth of this work, it is in reality the *cheapest ever published*. Each volume averages more than 500 pages of solid Long Primer and Brevier, of demy 8vo. size; all the contents consisting of summarised detail, and without any superfluous padding. It is a book for students, who really want *all the available information on the subject* dealt with. It is the *standard work* in use among *all the best scientific lepidopterists on the continent* as well as in the British Islands, and is *possibly more often referred to by workers on the Palaearctic fauna* than any other book in existence. It covers all the Continental work ever done on the groups treated, and not only gives the facts, but informs the student how to get at everything published on the subject he is reading.

The *illustrations* of the later volumes are *quite unequalled*. There are, in the volume now being published, *full-page life-histories of each species*, and *detailed structural plates* of egg, larvæ and larval hairs, spiracles, etc., pupæ and pupal hairs, spiracles, etc., and other *items illustrating quite new discoveries* in the structure of the early stages, etc.

The series of volumes forms indeed a standard work of reference, and any lepidopterist who possesses the volumes wants rarely to make reference to outside libraries for any detail, however unusual, on the subjects treated.

The general chapters, too, are summaries of everything known and published on the various subjects. The preliminary chapters, also, introducing each superfamily, cover the world-wide literature, and questions of classification and systematic entomology are discussed from the broad standpoint of the fauna of the world, and not from any restricted or limited point of view. The work, therefore, is one that appeals to all lepidopterists.

DEAR SIR,—

Please forward me Vol. IX of *The Natural History of British Lepidoptera*, for which I send herewith Cheque (or Postal Order) for £1.

Name

Address

Date

DEAR SIR,—Please forward me a set (7 vols.) of *The Natural History of British Lepidoptera*, for which I enclose Cheque (or Postal Order) for £6.

Name

Address

Mr. J. HERBERT TUTT,

22, Francemary Road, Ladywell Road, Brockley, S.E.

Practical Hints for the Field Lepidopterist (Illustrated.)

By J. W. TUTT, F.E.S.

PARTS I II & III

(Interleaved for Collector's own notes.)

Price 6s. each volume, net, or 17s. 6d. for the three parts.

Containing about 4000 Practical Hints of the form so well known.

Together with

General and Special Index to Parts I II & III.

(Containing references to nearly 1600 British species)

By H. J. TURNER, F.E.S.

Together with Chapters on

Preservation, Mounting, and Photographing of Eggs.

By F. NOAD CLARK AND A. E. TONGE, F.E.S.

Also detailed chapters on

"The Collection and Conservation of Lepidoptera," "Killing," "Pinning," "Entomological Pins," "Setting," "Labelling," "Holiday Collecting," "Collections," "Collecting," "The Egg and Egg Stage," "The Larva and Larval Stage," "The Pupa and Pupal Stage." Instructions on the technical description of "Eggs," "Larvæ," "Pupæ," etc.

The whole comprising the most important book on the subject ever offered to the field lepidopterist, and a complete encyclopædia of Field Lepidopterology.

Roughly, the number of species of lepidoptera in the whole British fauna amounts to about 2100 species. It was not until the three parts were carefully indexed by Mr. Turner that it was suspected how wide a field the "Hints" covered, and how comparatively few of the British species, other than the very commonest, received no "hint" as to their mode of capture in one or other of their stages. The long general index shows that the work is encyclopædic from the field lepidopterist's point of view; nothing so complete as the hints on sallowing, light, sugaring, egg-laying, larva-hunting (in all its forms), pupa-hunting, and the various phases of rearing lepidoptera—breeding-cages, treatment, food, etc.—having ever been attempted. In addition to these points, many chapters, simple enough for the beginner, and yet advanced enough to teach the expert something, have been added, with the intention of suggesting to the field lepidopterist how to use his observations and work, not only to his own advantage, but also to the advantage of entomological science, and the book can be recommended as being of first value to all field entomologists, whilst the chapters on the preservation, mounting, measurement, and photographing of eggs, will appeal to a very large class of entomologists.

DEAR SIR,—Please forward me a set of *Practical Hints*, Parts I, II, and III, for which I enclose Postal Order for **17s. 6d.**

Name.....

Address.....

To Mr. J. HERBERT TUTT, 22, Francemary Road, Ladywell Road, Brockley, S.E.

WATKINS & DONCASTER,

Naturalists and Manufacturers of Entomological Apparatus and Cabinets.

Plain Ring Nets, wire or cane, including Stick, 1/3, 2/-, 2/6. Folding Nets, 3/6, 4/-.
Umbrella Nets (self-acting), 7/-. Pocket Boxes, 6d., 9d., 1/-, 1/6. Zinc Relaxing Boxes,
9d., 1/-, 1/6, 2/-. Nested Chip Boxes, 7d. per four dozen. Entomological Pins, assorted
or mixed, 1/-, 1/6 per ounce. Pocket Lanterns, 2/6 to 8/-. Sugaring Tin, with brush, 1/6,
2/-. Sugaring Mixture, ready for use, 1/9 per tin. Store-Boxes, with camphor cells, 2/6,
4/-, 5/-, 6/-. Setting-Boards, flat or oval, 1in., 6d.; 1½in., 8d.; 2in., 10d.; 2½in., 1/-;
3½in., 1/4; 4in., 1/6; 5in., 1/10; Complete Set of fourteen Boards, 10/6. Setting Houses,
9/6, 11/6; corked back, 14/-. Zinc Larva Boxes, 9d., 1/-, 1/6. Breeding Cage, 2/6, 4/-,
5/-, 7/6. Coleopterist's Collecting Bottle, with tube, 1/6, 1/8. Botanical Cases, japanned,
double tin, 1/6 to 4/6. Botanical Paper, 1/1, 1/4, 1/9, 2/2 per quire. Insect Glazed Cases,
2/6 to 11/-. Cement for replacing Antennæ 4d. per bottle. Steel Forceps, 1/6, 2/-, 2/6 per
pair. Cabinet Cork, 7 by 3½, best quality 1/6 per dozen sheets. Brass Chloroform Bottle,
9/6. Insect Lens, 1/- to 8/-. Glass-top and Glass-bottomed Boxes, from 1/- per dozen.
Zinc Killing Box, 9d. to 1/-. Pupa Digger, in leather sheath, 1/9. Taxidermist's Com-
panion, containing most necessary implements for skinning, 10/6. Scalpels, 1/3; Scissors,
2/- per pair; Eggdrills, 2d., 3d., 9d.; Blowpipes, 4d.; Artificial Eyes for Birds and
Animals; Label-lists of British Butterflies, 2d.; ditto of Birds' Eggs, 2d., 3d., 6d.; ditto
of Land and Fresh-water Shells, 2d.; Useful Books on Insects, Eggs, etc.

THE WAND TELESCOPE NET (An innovation in Butterfly Nets).

We beg to call your attention to our new Telescopic Handle for butterfly nets. It is
made entirely in brass, and is light and strong, and, moreover, it can be shut up to carry
in small compass. A very compact pattern, effecting great saving in weight and bulk.

Prices—2 joints, 8/6; 3 joints, 9/6; 4 joints, 10/6.

Complete with cane folding ring and bag. We shall be pleased to send on application.

SHOW ROOM FOR CABINETS

Of every description of INSECTS, BIRDS' EGGS, COINS, MICROSCOPICAL OBJECTS, FOSSILS, &c.

Catalogue (100 pages) sent on application, post free.

LARGE STOCK OF INSECTS AND BIRDS' EGGS (British, European, and Exotic.)

Birds, Mammals, etc., Preserved and Mounted by First-class Workmen.

Only
Address—**36, STRAND, LONDON, W.C. (5 doors from Charing Cross)**

OVA, LARVÆ, AND PUPÆ.

The Largest Breeder of Lepidoptera in the British Isles is

H. W. HEAD, Entomologist,
SCARBOROUGH.

*Full List of Ova, Larvae, and Pupae, also Lepidoptera, Apparatus, Cabinets,
etc., sent on application.*

Many Rare British Species and Good Varieties for Sale.

Lantern Slides in Natural Colours.

LEPIDOPTERA & LARVÆ A SPECIALITY.

Photographed from life and true to Nature in every detail.

SLIDES OF BIRDS, WILD FLOWERS, &c.,

By same Colour Process.

LANTERN SLIDES MADE TO ORDER FROM ANY SPECIMEN OR COLOURED DRAWING.

**PHOTOS IN COLOUR OF LARVÆ, LIFE SIZE, ON IVORINE
TABLETS TO PIN IN THE CABINET.**

For List apply to—

CHARLES D. HEAD, 2, Mount Vernon, Dollymount, DUBLIN.

The Entomologist's Library.

By J. W. TUTT, F.E.S.

A Natural History of the British Lepidoptera, their world-wide variation and geographical distribution (*illustrated*).

(A text-book for Students and Collectors.)

Vols. I, II, III, IV, V and VIII, IX, Price £1 each volume, net. Demy 8vo., thick, strongly bound in cloth. Complete set of 7 vols., £6 net. The most concise and thorough work on Lepidoptera ever offered to the entomological public.

A Natural History of the British Butterflies, their world-wide variation and geographical distribution (*illustrated*).

(A text-book for Students and Collectors.)

Vol. I and II. Price one guinea each net. Vol. III in course of publication (Monthly parts, 1/-).

A detailed account of the biology and variation of each British species, and a consideration of the literature and classification of the Palæarctic species.

A Natural History of the British Alucitides, their world-wide variation and geographical distribution.

(A text-book for Students and Collectors.)

Vol. I. Price one guinea net. (To be completed in two volumes.)

Full details of the life-history of every British species; full historical account of the group and its classification.

Migration and Dispersal of Insects. Demy 8vo. Price 5s. net.

A detailed account of the migration of the Aphides, Orthoptera, Odonata, Diptera, Coleoptera, Hymenoptera, and Lepidoptera.

Practical Hints for the Field Lepidopterist (*illustrated*).

Three parts, 6s. each net. Complete set, 17s. 6d. A detailed set of some 4000 practical hints. Full information for collecting, preserving, and using the material for scientific purposes.

The British Noctuæ and their Varieties. Complete in 4 volumes.

28s. per set net. Demy 8vo., strongly bound in cloth. Full account of the typical and all known described forms, with original descriptions.

Melanism and Melanochroism in British Lepidoptera.

Demy 8vo., bound in cloth. Price 5s. A full account of all the facts known bearing on the subject, and a closely reasoned explanation of probable causes.

100 Practical Hints on the British Eupitheciids. Price 1s.

A series of hints on the method of finding and rearing eggs, larvæ, pupæ and imagines of the "pugs."

Monograph of the British Pterophorina. Demy 8vo., 161 pp.

Bound in Cloth. Price 5s. net. An account of every British species and its life-history—each described under a series of detailed headings.

Rambles in Alpine Valleys. Crown 8vo. Bound in Cloth. With map

and photographs. Price 3s. 6d. net. A graphic account of the rambles of a naturalist on the Italian side of Mont Blanc.

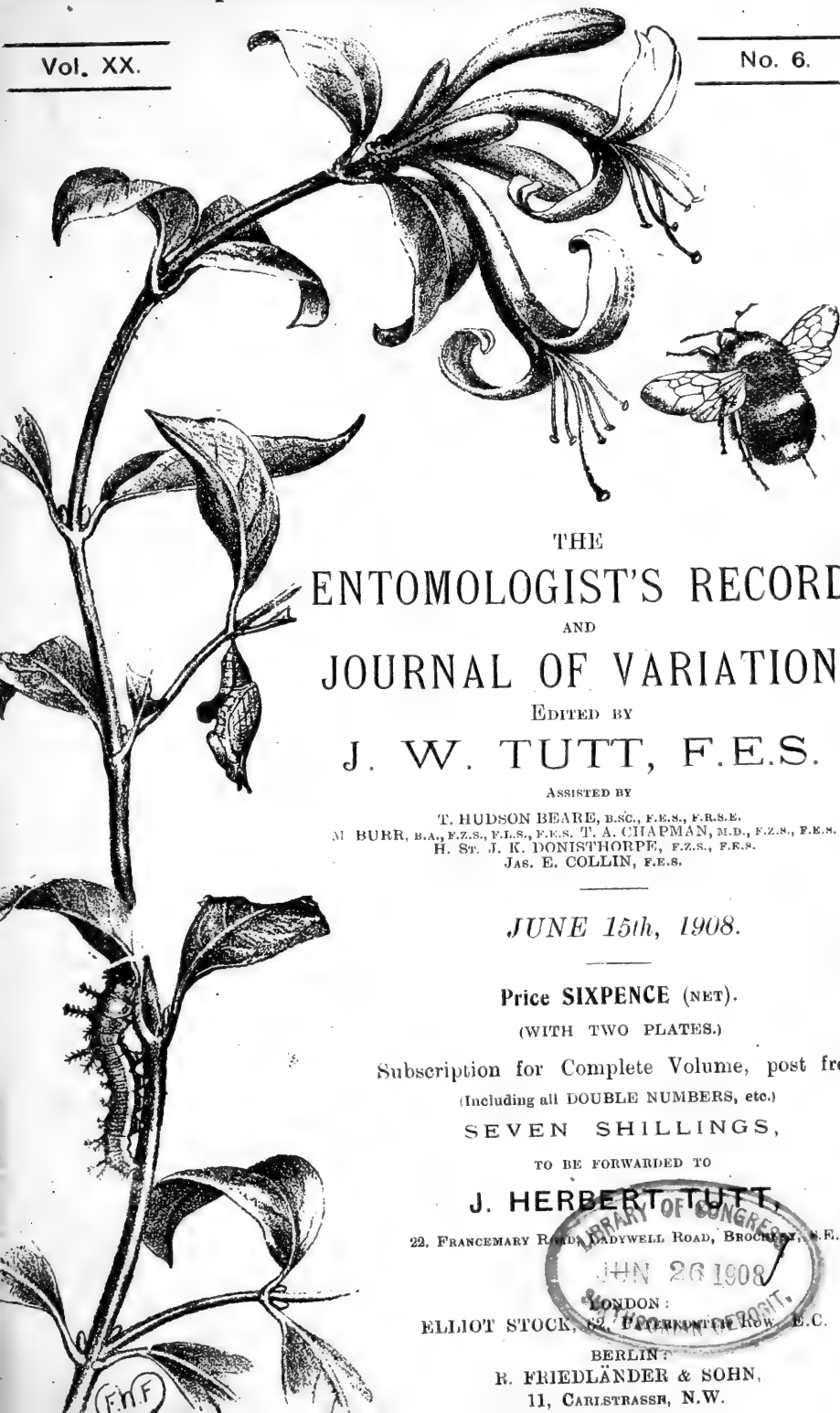
Woodside, Burnside, Hillside, and Marsh. Crown 8vo. Bound

in Cloth. 242 pp. and 103 woodcuts and full-page illustrations. Price 2s. 6d. net. Descriptive account of well-known natural history localities (botanical, entomological, geological, ornithological), including Cobham, Cliffe, Cuxton, the Western Highlands, &c.

Random Recollections of Woodland, Fen, and Hill. Crown

8vo. Bound in Cloth. Price 3s. net. A detailed account of the fauna and flora of some well-known British natural history localities—Wicken, Deal, Chattenden, the Medway marshes, Freshwater, &c.

To be obtained from J. H. TUTT, 22, Francemary Road, Ladywell Road, Brockley, S.E., to whom Cheques and Postal Orders should be sent.



THE
ENTOMOLOGIST'S RECORD
AND
JOURNAL OF VARIATION
EDITED BY
J. W. TUTT, F.E.S.

ASSISTED BY

T. HUDSON BEARE, B.Sc., F.E.S., F.R.S.E.
M. BURR, B.A., F.Z.S., F.L.S., F.E.S. T. A. CHAPMAN, M.D., F.Z.S., F.E.S.
H. ST. J. K. DONISTHORPE, F.Z.S., F.E.S.
JAS. E. COLLIN, F.E.S.

JUNE 15th, 1908.

Price SIXPENCE (NET).

(WITH TWO PLATES.)

Subscription for Complete Volume, post free
(Including all DOUBLE NUMBERS, etc.)

SEVEN SHILLINGS,

TO BE FORWARDED TO

J. HERBERT TUTT,

22, FRANCIS ROAD, LADYWELL ROAD, BROCKLEY, S.E.

LONDON:
ELLIOT STOCK, 62, FLEET STREET, E.C.

BERLIN:
R. FRIEDLÄNDER & SOHN,
11, CARLSTRASSE, N.W.

GRESHAM LIFE OFFICE.

Founded 1848.

Assets, £9,500,000.

NEW FEATURE.

Endowment Assurance Policy, WITH CESSATION OF PREMIUMS DURING INCAPACITY (Temporary or Permanent.)

VERY MODERATE PREMIUMS.

Head Office—ST. MILDRED'S HOUSE, POULTRY, LONDON, E.C.

JAMES H. SCOTT, *General Manager and Secretary.*

THE GRESHAM LIFE ASSURANCE SOCIETY, LIMITED.

D. F. TAYLER & Co., Ltd., Entomological Pin Manufacturers,

SMALL HEADS AND PERFECT POINTS. WHITE, BLACK, AND GILT.

BIRMINGHAM and LONDON.

Can be obtained from Dealers throughout the World.

NEW FOREST BUTTERFLIES & MOTHS

Ova, Larvæ, Pupæ, and (bred) Imagines supplied to order by

G. TATE and SON,
Entomologists, Lyndhurst, New Forest.

Established 1870.

Instructions given in Practical Entomology. Correspondence invited.

LABELS! LABELS!! LABELS!!!

It is very essential that every specimen, to be authentic, should bear a minute label, giving locality, date of capture, and name of captor.

3000

(To comprise equal numbers of not more than ten localities.)
Larger quantities *pro rata*. Orders executed in same order as
received. Remittance in full must accompany each order.

5/-

Rannoch
16. vi. 97

New Forest
4. ix. 97

Shetland
5. v. 97

ADDRESS.—“Requisites,” Coombe Lodge, Mycenæ Road,
Westcombe Park, S.E.

Melanism and Melanochroism in British Lepidoptera

(Demy 8vo., bound in Cloth. Price 5/-.)

Deals exhaustively with all the views brought forward by scientists to account for the forms of melanism and melanochroism; contains full data respecting the distribution of melanic forms in Britain, and theories to account for their origin; the special value of “natural selection,” “environment,” “heredity,” “disease,” “temperature,” &c., in particular cases. Lord Walsingham, in his Presidential address to the Fellows of the Entomological Society of London, says, “An especially interesting line of enquiry as connected with the use and value of colour in insects is that which has been followed up in Mr. Tutt's series of papers on ‘Melanism and Melanochroism.’”

J. HERBERT TUTT, 22, Francemary Road, Ladywell Road, Brockley, S.E.

SPLENDID ! THANKS ! !

One does not hear this or a similar expression of glad feeling as often as one could wish, and its absence is frequently due to man's dilatoriness in exercising a proper care for his health. The habit of procrastination is strong in human nature. A slight indisposition—a feeling of being a bit "below par"—is given very little heed to, with the result that alarming symptoms often ensue. It is a truism that most sickness takes its rise in Indigestion, or a torpid state of the Liver and Bowels—conditions where

BEECHAM'S PILLS

may be depended upon with absolute confidence to effect a cure. Therefore, never permit the trouble to gain a hold upon your constitution—check it at the outset. Whether it be a case of Indigestion, Biliousness, Constipation, or an Anæmic and impure state of the blood, you should at once set about fortifying yourself by entering upon a course of BEECHAM'S PILLS. All sensations of depression and undue fatigue will disappear, your energies will speedily revive, you will regain all your lost vigour, and ere long you will join with tens of thousands in saying that, for "putting one right," BEECHAM'S PILLS

DESERVE ALL PRAISE.

Prepared only by **THOMAS BEECHAM**, St. Helens, Lancs.

Sold everywhere in boxes, price 1/1½ (56 pills) & 2/9 (168 pills.)

Subscriptions for Vol. XX (7 shillings) are now overdue, and should be sent without delay (and so save time and correspondence) to **J. Herbert Tutt, 22, Francemary Road, Ladywell Road, Brockley, S.E.** Will subscribers please oblige? [This subscription includes all numbers published from January 15th to December 15th, 1908.]

Non-receipt or errors in the sending of Subscribers' magazines should be notified to **Mr. H. E. Page, "Bertrose," Gellatly Road, Hatcham, S.E.**

NOTICE.

The **Back Volumes (I-XIX)** of *The Entomologist's Record*, &c., can be obtained at 10s. 6d. per Volume. Complete set of 19 vols. £6 13s. 6d. net. "**Special Index**" to Vols. III., IV., V., VI., VII., VIII., IX., X., XI., XII., XIII., XIV., XV., XVI., XVII., XVIII. and XIX., are sold separately, price 1/6 each. **Single Back Numbers** can be obtained at double the published price from **119, Westcombe Hill, Blackheath, S.E.**

Subscribers are kindly requested to observe that subscriptions to *The Entomologist's Record*, &c., are payable in advance. The subscription (with or without the Special Index) is Seven Shillings, and must be sent to **Mr. J. Herbert Tutt, 22, Francemary Road, Ladywell Road, Brockley, S.E.** Cheques and Postal Orders should be made payable to **J. W. Tutt**.

ADVERTISEMENTS of Books and Insects for Sale will be inserted at a minimum charge of 2s. 6d. (for four lines). Longer Advertisements in proportion. A reduction made for a series. Particulars of **Mr. J. Herbert Tutt, 22, Francemary Road, Ladywell Road, Brockley, S.E.**

Subscribers who change their addresses must report the same to **Mr. H. E. Page, "Bertrose," Gellatly Road, St. Catherine's Park, London, S.E.**, otherwise their magazines will probably be delayed, also to **Mr. J. HERBERT TUTT, 22, Francemary Road, Ladywell Road, Brockley, S.E.**

Articles for insertion and Exchanges should be sent to **J. W. TUTT, Rayleigh Villa, Westcombe Hill, S.E.**, except notes relating to Coleoptera, which should be sent to **Mr. H. DOXTON, 58, Kensington Mansions, South Kensington, S.W.**, and of Orthoptera, to **Mr. Burr, Eastry S.O., Kent.**

Articles that require Illustration are inserted on condition that the author defrays the cost of the illustrations.

All Exchange Magazines must be forwarded to **J. W. TUTT, Rayleigh Villa, Westcombe Hill, Blackheath, S.E.**

EXCHANGES.—The use of this column for the offer of "Duplicates" and "Desiderata" and "Changes of Address" is open free to subscribers so long as space is available.

Duplicates.—**Monacha* and larvæ, ova of *Tiliæ*, **Gracilis* (red var.), **Betulæ* (males). *Hyale*, *Edusa*, *Unigera*, *Littoralis*, *Muralis*, *Corticæ*, *Irrorella*, *Cracæ* (fair), *Orion*, *Strataria*, *Humiliata*, *Dealbata*. *Desiderata*.—Larva of *Caja* (north of England), Lancashire wild larvæ or pupæ of *Grossulariata* in quantity.—*W. J. Ogden, 1, West Bank, Stamford Hill, London, N.*

Duplicates.—*Complanella*, *Emberizæpennella*, *Coryli*, *Bremiella*, *Alnifoliella*, *Solitariella*, *Salicicolella*, *Spinolella*, *Lautella*, *Carpinicolella*, *Semidecandriella*, *Marginea*, *Pomifoliella*, *Cramerella*, *Maritima*, *Sylvella*, *Miscella*, *Stettinensis*, *Lantanella*, *Pfeifferella*, For any specimens useful in my cabinets. Will send marked list.—*J. A. Clark*, 57, *Weston Park, Crouch End, N.*

Duplicates.—Larvæ of *Versicolora* (from wild Scotch parents), *O. autumnata* (very dark); also of dark, heavily-marked *Flavicornis*, *Bistortata*, *Tristata*, *Liturata* var. *nigroluvata*. Wanted for experimental purposes larvæ of *Filigrammaria*, *Ashworthii*.—*J. W. H. Harrison*, 181, *Abingdon Road, Middlesbro'*.

Duplicates.—Larvæ of *W-Album*, *Cassinea*, *Straminea*, *Cespitis*, *Suavella*, *Galactodactyla*, *Pterodactyla* (*Fuscus*), *Septodactyla* (*Lienigianus*), and *Phæodactyla*.—*J. Ovenden*, *Frindsbury Road, Strood, Kent*.

WANTED.—Indian *Theclas*, *Chrysophanids*, and *Lycænids*. Offered—*Palæarctic* and *Nearctic* species.—*J. W. H. Harrison*, 181, *Abingdon Road, Middlesbro'*.

WANTED.—Good photographs or careful drawings of *Aberrations*, *Gynandromorphs*, etc., of any British "Blues," for reproduction in *The Natural History of the British Butterflies*. Also photos and good drawings of *Aberrations* and *Gynandromorphs* of other groups that may be used later as opportunity offers. [Specimens not necessarily British.] *J. W. Tutt*, 119, *Westcombe Hill, Blackheath*.

CHANGES OF ADDRESS.—*Mr. M. Burr* to *Eastry S.O., Kent*.

MEETINGS OF SOCIETIES.

Entomological Society of London.—11, Chandos Street, Cavendish Square, W., 8 p.m. Meetings—October 7th, 21st, November 4th, 18th, December 2nd.

The City of London Entomological and Natural History Society.—London Institution, Finsbury Circus, E.C.—The first and third Tuesdays in the month, at 7.30 p.m., except in July and August.

Toynbee Hall Natural History Society.—Held at Toynbee Hall, Commercial Street, E., Mondays, at 8 p.m. Meetings—July 6th; September 7th, Exhibition Meeting. [No meeting in August.] Excursions—June 28th, Sevenoaks; train 9.12 a.m., Cannon Street. July 11th, Loughton; train 2 p.m., Liverpool Street. July 26th, Rickmansworth; train 10.5 a.m., Baker Street. August 16th, Woking; train 10 a.m., Waterloo. September 5th, Hayes; train 2.27 p.m., Cannon Street. September 20th, Bookham; train 10.5 a.m., Waterloo.

The South London Entomological and Natural History Society, *Hibernia Chambers*, London Bridge.—The second and fourth Thursdays in each month, at 8 p.m. Field Meetings—June 20th, to Box Hill, conducted by H. J. Turner; July 11th, to Ranmore, W. J. Kaye; July 25th, to Byfleet, S. Edwards and A. Sieh; September 19th, to Claygate, H. J. Turner; October (date not fixed), Fungus Foray, E. Step.

North London Natural History Society, *The Amherst Club*, Amhurst Road, N.—Meetings—June 23rd, 1906, "Easy methods of breeding our grass-feeding butterflies," C. P. Pickett, F.E.S.; Excursion, June 20th to Cobbin's End (Liverpool Street to Theydon Bois, 2.41 p.m.).

Lancashire and Cheshire Entomological Society.—Meetings at the Royal Institution, Liverpool, on the 3rd Monday in the month from October to April. Hon. Sec., H. R. Sweeting, 6, The Elms, Dingle, Liverpool.

Monograph of the British Pterophorina.

By J. W. TUTT, F.E.S.

(Demy 8vo., 161 pp., bound in Cloth.)

Price 5/- net.

This book contains an introductory chapter on "Collecting," "Killing" and "Setting" the Pterophorina, a table giving details of each species—Times of appearance of larva, of pupa, and of imago, food-plants, mode of pupation, and a complete account (so far as is known) of every British species, under the headings of "Synonymy," "Imago," "Variation," "Ovum," "Larva," "Food-plants," "Pupa," "Habitat," and "Distribution." It is much the most complete and trustworthy account of this interesting group of Lepidoptera that has ever been published.

Natural History of the British Lepidoptera.

By J. W. TUTT, F.E.S.

Vol. IX.

Price £1 net.

Vol. IX of this Encyclopædic work has just been completed. It contains full and detailed accounts of the "Hairstreaks" and "Blue" butterflies, dealing in the most comprehensive manner with every phase of their life-history, variation, and distribution. The volume is divided into two sections, the General Chapters dealing with a variety of the phenomena attendant on the natural activities of butterfly larvæ; the second, the systematic description, biology and distribution of the species dealt with, and the discussion of the literature and characters of the families, subfamilies and genera to which the species belong, forming, as it were, a basis for the detailed consideration of the world-fauna.

There are now published.—Vols. I-V and VIII-IX, the seven volumes forming a complete monographic revision of the species dealt with.

To new subscribers to the whole work the complete set of 7 volumes will be forwarded direct for £6. (If ordered through the booksellers, the price is £1 net each volume. Only those who send their names to Mr. J. Herbert Tutt as continuous subscribers can be supplied at this price and application must be to him direct.)

In spite of the apparent dearth of this work, it is in reality the *cheapest ever published*. Each volume averages more than 500 pages of solid Long Primer and Brevier, of demy 8vo. size; all the contents consisting of summarised detail, and without any superfluous padding. It is a book for students, who really want all the available information on the subject dealt with. It is the standard work in use among all the best scientific lepidopterists on the continent as well as in the British Islands, and is possibly more often referred to by workers on the Palearctic fauna than any other book in existence. It covers all the Continental work ever done on the groups treated, and not only gives the facts, but informs the student how to get at everything published on the subject he is reading.

The illustrations of the later volumes are quite unequalled. There are, in the volume now being published, full-page life-histories of each species, and detailed structural plates of egg, larvæ and larval hairs, spiracles, etc., pupæ and pupal hairs, spiracles, etc., and other items illustrating quite new discoveries in the structure of the early stages, etc.

The series of volumes forms indeed a standard work of reference, and any lepidopterist who possesses the volumes wants rarely to make reference to outside libraries for any detail, however unusual, on the subjects treated.

The general chapters, too, are summaries of everything known and published on the various subjects. The preliminary chapters, also, introducing each superfamily, cover the world-wide literature, and questions of classification and systematic entomology are discussed from the broad standpoint of the fauna of the world, and not from any restricted or limited point of view. The work, therefore, is one that appeals to all lepidopterists.

DEAR SIR,—

Please forward me Vol. IX of *The Natural History of British Lepidoptera*, for which I send herewith Cheque (or Postal Order) for £1.

Name.....

Address.....

Date.....

DEAR SIR,—Please forward me a set (7 vols.) of *The Natural History of British Lepidoptera*, for which I enclose Cheque (or Postal Order) for £6.

Name.....

Address.....

Mr. J. HERBERT TUTT,

22, Francemary Road, Ladywell Road, Brockley, S.E.

Practical Hints for the Field Lepidopterist (Illustrated.)

By J. W. TUTT, F.E.S.

PARTS I II & III

(Interleaved for Collector's own notes.)

Price 6s. each volume, net, or 17s. 6d. for the three parts.

Containing about 4000 Practical Hints of the form so well known.

Together with

General and Special Index to Parts I II & III.

(Containing references to nearly 1600 British species)

By H. J. TURNER, F.E.S.

Together with Chapters on

Preservation, Mounting, and Photographing of Eggs.

By F. NOAD CLARK AND A. E. TONGE, F.E.S.

Also detailed chapters on

"The Collection and Conservation of Lepidoptera," "Killing," "Pinning," "Entomological Pins," "Setting," "Labelling," "Holiday Collecting," "Collections," "Collecting," "The Egg and Egg Stage," "The Larva and Larval Stage," "The Pupa and Pupal Stage." Instructions on the technical description of "Eggs," "Larvæ," "Pupæ," etc.

The whole comprising the most important book on the subject ever offered to the field lepidopterist, and a complete encyclopædia of Field Lepidopterology.

Roughly, the number of species of lepidoptera in the whole British fauna amounts to about 2100 species. It was not until the three parts were carefully indexed by Mr. Turner that it was suspected how wide a field the "Hints" covered, and how comparatively few of the British species, other than the very commonest, received no "hint" as to their mode of capture in one or other of their stages. The long general index shows that the work is encyclopædic from the field lepidopterist's point of view; nothing so complete as the hints on sallowing, light, sugaring, egg-laying, larva-hunting (in all its forms), pupa-hunting, and the various phases of rearing lepidoptera—breeding-cages, treatment, food, etc.—having ever been attempted. In addition to these points, many chapters, simple enough for the beginner, and yet advanced enough to teach the expert something, have been added, with the intention of suggesting to the field lepidopterist how to use his observations and work, not only to his own advantage, but also to the advantage of entomological science, and the book can be recommended as being of first value to all field entomologists, whilst the chapters on the preservation, mounting, measurement, and photographing of eggs, will appeal to a very large class of entomologists.

DEAR SIR,—Please forward me a set of *Practical Hints*, Parts I, II, and III, for which I enclose Postal Order for **17s. 6d.**

Name.....

Address.....

To Mr. J. HERBERT TUTT, 22, Francemary Road, Ladywell Road, Brockley, S.E.

WATKINS & DONCASTER,

Naturalists and Manufacturers of Entomological Apparatus and Cabinets.

Plain Ring Nets, wire or cane, including Stick, 1/3, 2/-, 2/6, 3/- . Folding Nets, 3/6, 4/-, 4/6. Umbrella Nets (self-acting), 7/- . Pocket Boxes (deal), 6d., 9d., 1/-, 1/6. Zinc Collecting Boxes, 9d., 1/-, 1/6, 2/- . Nested Chip Boxes, 7d. per four dozen, 1 gross, 1/6. Entomological Pins, 1/6 per ounce. Pocket Lanterns, 2/6 to 8/- . Sugaring Tin, with brush, 1/6, 2/- . Sugaring Mixture, ready for use, 1/9 per tin. Store-Boxes, with camphor cells, 2/6, 4/-, 5/-, 6/- . Setting-Boards, flat or oval, 1in., 6d.; 1½in., 8d.; 2in., 10d.; 2½in., 1/-; 3½in., 1/4; 4in., 1/6; 5in., 1/10; Complete Set of fourteen Boards, 10/6. Setting Houses, 9/6, 11/6; corked back, 14/- . Zinc Larva Boxes, 9d., 1/-, 1/6. Breeding Cage, 2/6, 4/-, 5/-, 7/6. Coleopterist's Collecting Bottle, with tube, 1/6, 1/8. Botanical Cases, japanned double tin, 1/6 to 4/6. Botanical Paper, 1/1, 1/4, 1/9, 2/2 per quire. Insect Glazed Cases, 2/6 to 11/- . Cement for replacing Antennæ 4d. per bottle. Steel Forceps, 1/6, 2/-, 2/6 per pair. Cabinet Cork, 7 by 3½, best quality 1/6 per dozen sheets. Brass Chloroform Bottle, 2/6. Insect Lens, 1/- to 8/- . Glass-top and Glass-bottomed Boxes, from 1/- per dozen. Zinc Killing Box, 9d. to 1/- . Pupa Digger, in leather sheath, 1/9. Taxidermist's Companion, containing most necessary implements for skinning, 10/6. Scalpels, 1/3; Scissors, 2/- per pair; Eggdrills, 2d., 3d., 9d.; Blowpipes, 4d.; Artificial Eyes for Birds and Animals. Label-lists of British Butterflies, 2d.; ditto of Birds' Eggs, 2d., 3d., 6d.; ditto of Land and Fresh-water Shells, 2d. Useful Books on Insects, Eggs, etc.

THE WAND TELESCOPE NET (An innovation in Butterfly Nets).

We beg to call your attention to our new Telescopic Handle for butterfly nets. It is made entirely in brass, and is light and strong, and, moreover, it can be shut up to carry in small compass. A very compact pattern, effecting great saving in weight and bulk.

Prices—2 joints, 8/6; 3 joints, 9/6; 4 joints, 10/6.

Complete with cane folding ring and bag. We shall be pleased to send on application.

SHOW ROOM FOR CABINETS

Of every description of INSECTS, BIRDS' EGGS, COINS, MICROSCOPICAL OBJECTS, FOSSILS, &c.

Catalogue (100 pages) sent on application, post free.

LARGE STOCK OF INSECTS AND BIRDS' EGGS (British, European, and Exotic).

Birds, Mammals, etc., Preserved and Mounted by First-class Workmen.

Only Address—**36, STRAND, LONDON, W.C.** (5 doors from Charing Cross).

OVA, LARVÆ, AND PUPÆ.

The Largest Breeder of Lepidoptera in the British Isles is

H. W. HEAD, Entomologist,
SCARBOROUGH.

Full List of Ova, Larvae, and Pupae, also Lepidoptera, Apparatus, Cabinets, etc., sent on application.

Many Rare British Species and Good Varieties for Sale.

Lantern Slides in Natural Colours.

LEPIDOPTERA & LARVÆ A SPECIALITY.

Photographed from life and true to Nature in every detail.

SLIDES OF BIRDS, WILD FLOWERS, &c.,

By same Colour Process.

LANTERN SLIDES MADE TO ORDER FROM ANY SPECIMEN OR COLOURED DRAWING.

**PHOTOS IN COLOUR OF LARVÆ, LIFE SIZE, ON IVORINE
TABLETS TO PIN IN THE CABINET.**

For List apply to—

CHARLES D. HEAD, 2, Mount Vernon, Dollymount, DUBLIN.

The Entomologist's Library.

By J. W. TUTT, F.E.S.

A Natural History of the British Lepidoptera, their world-wide variation and geographical distribution (*illustrated*).

(A text-book for Students and Collectors.)

Vols. I, II, III, IV, V and VIII, IX, Price £1 each volume, net. Demy 8vo., thick, strongly bound in cloth. Complete set of 7 vols., £6 net. The most concise and thorough work on Lepidoptera ever offered to the entomological public.

A Natural History of the British Butterflies, their world-wide variation and geographical distribution (*illustrated*).

(A text-book for Students and Collectors.)

Vol. I and II. Price one guinea each net. Vol. III in course of publication (Monthly parts, 1/-).

A detailed account of the biology and variation of each British species, and a consideration of the literature and classification of the Palearctic species.

A Natural History of the British Alucitides, their world-wide variation and geographical distribution.

(A text-book for Students and Collectors.)

Vol. I. Price one guinea net. (To be completed in two volumes.)

Full details of the life-history of every British species; full historical account of the group and its classification.

Migration and Dispersal of Insects. Demy 8vo. Price 5s. net.

A detailed account of the migration of the Aphides, Orthoptera, Odonata, Diptera, Coleoptera, Hymenoptera, and Lepidoptera.

Practical Hints for the Field Lepidopterist (*illustrated*).

Three parts, 6s. each net. Complete set, 17s. 6d. A detailed set of some 4000 practical hints. Full information for collecting, preserving, and using the material for scientific purposes.

The British Noctuæ and their Varieties. Complete in 4 volumes.

28s. per set net. Demy 8vo., strongly bound in cloth. Full account of the typical and all known described forms, with original descriptions.

Melanism and Melanochroism in British Lepidoptera.

Demy 8vo., bound in cloth. Price 5s. A full account of all the facts known bearing on the subject, and a closely reasoned explanation of probable causes.

100 Practical Hints on the British Eupitheciids. Price 1s.

A series of hints on the method of finding and rearing eggs, larvæ, pupæ and imagines of the "pugs."

Monograph of the British Pterophorina. Demy 8vo., 161 pp.

Bound in Cloth. Price 5s. net. An account of every British species and its life-history—each described under a series of detailed headings.

Rambles in Alpine Valleys. Crown 8vo. Bound in Cloth. With map

and photographs. Price 3s. 6d. net. A graphic account of the rambles of a naturalist on the Italian side of Mont Blanc.

Woodside, Burnside, Hillside, and Marsh. Crown 8vo. Bound

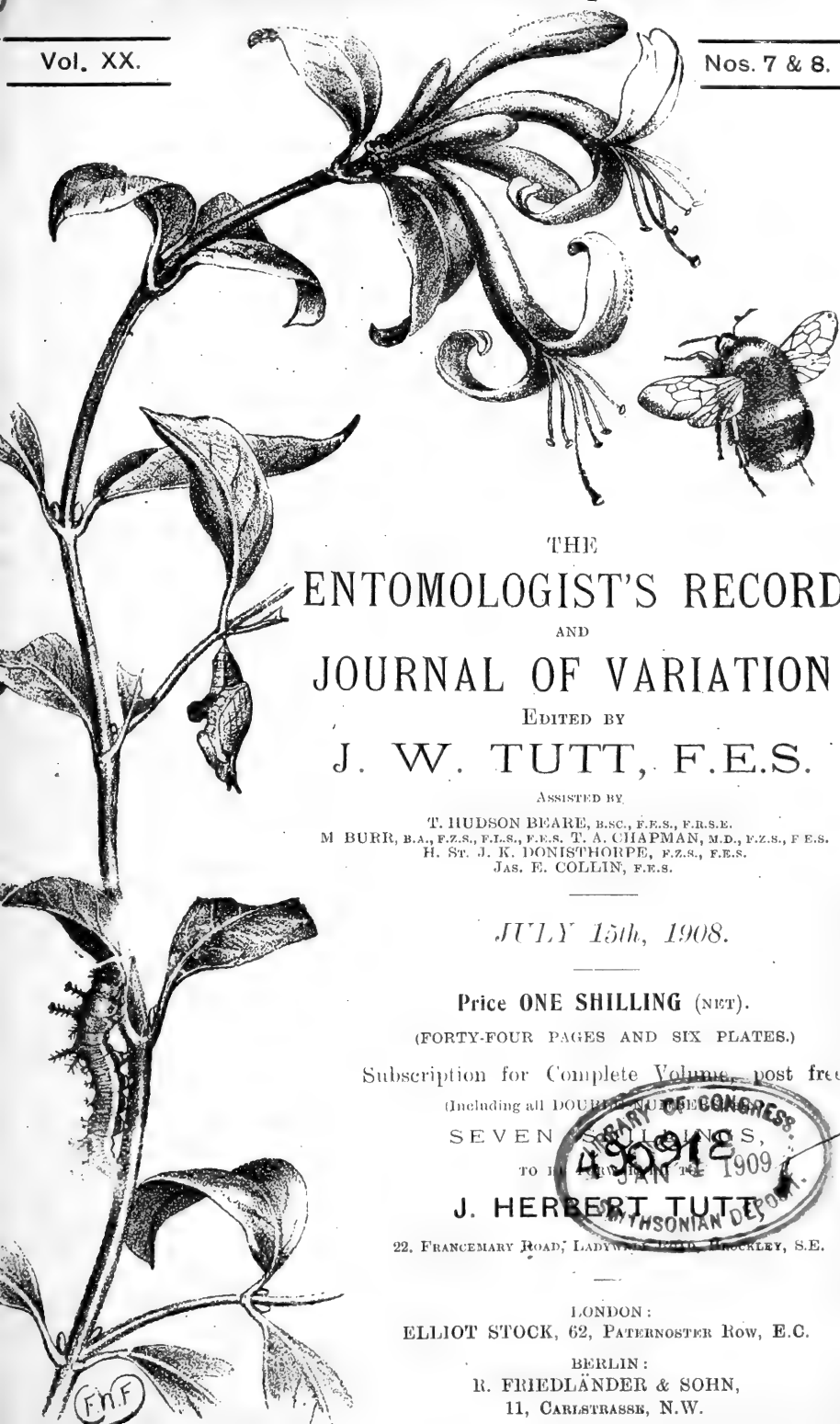
in Cloth. 242 pp. and 103 woodcuts and full-page illustrations. Price 2s. 6d. net. Descriptive account of well-known natural history localities (botanical, entomological, geological, ornithological), including Cobham, Cliffe, Cuxton, the Western Highlands, &c.

Random Recollections of Woodland, Fen, and Hill. Crown

8vo. Bound in Cloth. Price 3s. net. A detailed account of the fauna and flora of some well-known British natural history localities—Wicken, Deal, Chattenden, the Medway marshes, Freshwater, &c.

Vol. XX.

Nos. 7 & 8.



THE
ENTOMOLOGIST'S RECORD
AND
JOURNAL OF VARIATION
EDITED BY
J. W. TUTT, F.E.S.

ASSISTED BY

T. HUDSON BEARE, B.SC., F.E.S., F.R.S.E.
M. BURR, B.A., F.Z.S., F.L.S., F.E.S. T. A. CHAPMAN, M.D., F.Z.S., F.E.S.
H. ST. J. K. DONISTHORPE, F.Z.S., F.E.S.
JAS. E. COLLIN, F.E.S.

JULY 15th, 1908.

Price ONE SHILLING (NET).

(FORTY-FOUR PAGES AND SIX PLATES.)

Subscription for Complete Volume, post free

(Including all DOUBLE VOLUMES,
SEVEN SHILLINGS,
TO 1 JANUARY 1909.)

J. HERBERT TUTT

22, FRANCIS ROAD, LADYMAN ROAD, BRICKLEY, S.E.

LONDON:

ELLIOT STOCK, 62, PATERNOSTER ROW, E.C.

BERLIN:

R. FRIEDLÄNDER & SOHN,
11, CARLSTRASSE, N.W.



Immediate Annuities **With Return of Purchase Money**

IN EVENT OF EARLY DEATH.

For Particulars write . . .

GRESHAM LIFE ASSURANCE SOCIETY, LTD.

ST. MILDRED'S HOUSE, LONDON, E.C.

ASSETS EXCEED - £9,800,000.

JAMES H. SCOTT, General Manager and Secretary.

D. F. TAYLER & Co., Ltd.,
Entomological Pin Manufacturers,

SMALL HEADS AND PERFECT POINTS. WHITE, BLACK, AND GILT.

BIRMINGHAM and LONDON.

Can be obtained from Dealers throughout the World.

NEW FOREST BUTTERFLIES & MOTHS

Ova, Larvæ, Pupæ, and (bred) Imagines supplied to order by

G. TATE and SON,

Entomologists, Lyndhurst, New Forest.

Established 1870.

Instructions given in Practical Entomology. Correspondence invited.

LABELS ! LABELS !! LABELS !!!

It is very essential that every specimen, to be authentic, should bear a minute label, giving locality, date of capture, and name of captor.

3000

(To comprise equal numbers of not more than ten localities.)
(Larger quantities *pro rato*. Orders executed in same order as
received. Remittance in full must accompany each order.)

5/-

Rannoch
16. vi. 97

New Forest
4. ix. 97

Shetland
5. v. 97

**ADDRESS.—“Requisites,” Coombe Lodge, Mycenæ Road,
Westcombe Park, S.E.**

Melanism and Melanochroism in British Lepidoptera

(Demy 8vo., bound in Cloth. Price 5/-.)

Deals exhaustively with all the views brought forward by scientists to account for the forms of melanism and melanochroism; contains full data respecting the distribution of melanic forms in Britain, and theories to account for their origin; the special value of “natural selection,” “environment,” “heredity,” “disease,” “temperature,” &c., in particular cases. Lord Walsingham, in his Presidential address to the Fellows of the Entomological Society of London, says, “An especially interesting line of enquiry as connected with the use and value of colour in insects is that which has been followed up in Mr. Tutt's series of papers on ‘Melanism and Melanochroism.’”

J. HERBERT TUTT, 22, Francemary Road, Ladywell Road, Brockley, S.E.

SPLENDID ! THANKS ! !

One does not hear this or a similar expression of glad feeling as often as one could wish, and its absence is frequently due to man's dilatoriness in exercising a proper care for his health. The habit of procrastination is strong in human nature. A slight indisposition—a feeling of being a bit "below par"—is given very little heed to, with the result that alarming symptoms often ensue. It is a truism that most sickness takes its rise in Indigestion, or a torpid state of the Liver and Bowels—conditions where

BEECHAM'S PILLS

may be depended upon with absolute confidence to effect a cure. Therefore, never permit the trouble to gain a hold upon your constitution—check it at the outset. Whether it be a case of Indigestion, Biliousness, Constipation, or an Anæmic and impure state of the blood, you should at once set about fortifying yourself by entering upon a course of BEECHAM'S PILLS. All sensations of depression and undue fatigue will disappear, your energies will speedily revive, you will regain all your lost vigour, and ere long you will join with tens of thousands in saying that, for "putting one right," BEECHAM'S PILLS

DESERVE ALL PRAISE.

Prepared only by **THOMAS BEECHAM**, St. Helens, Lancs.

Sold everywhere in boxes, price 1/1½ (56 pills) & 2/9 (168 pills.)

Subscriptions for Vol. XX (7 shillings) are now overdue, and should be sent without delay (and so save time and correspondence) to **J. Herbert Tutt, 22, Francemary Road, Ladywell Road, Brockley, S.E.** Will subscribers please oblige? [This subscription includes all numbers published from January 15th to December 15th, 1908.]

Non-receipt or errors in the sending of Subscribers' magazines should be notified to **Mr. H. E. Page, "Bertrose," Gellatly Road, Hatcham, S.E.**

NOTICE.

The Back Volumes (I-XIX) of *The Entomologist's Record*, &c., can be obtained at 10s. 6d. per Volume. Complete set of 19 vols. £6 13s. 6d. net. "Special Index" to Vols. III., IV., V., VI., VII., VIII., IX., X., XI., XII., XIII., XIV., XV., XVI., XVII., XVIII. and XIX., are sold separately, price 1/6 each. Single Back Numbers can be obtained at double the published price from **119, Westcombe Hill, Blackheath, S.E.**

Subscribers are kindly requested to observe that subscriptions to *The Entomologist's Record*, &c., are payable in advance. The subscription (with or without the Special Index) is Seven Shillings, and must be sent to **Mr. J. Herbert Tutt, 22, Francemary Road, Ladywell Road, Brockley, S.E.** Cheques and Postal Orders should be made payable to **J. W. Tutt.**

ADVERTISEMENTS of Books and Insects for Sale will be inserted at a minimum charge of 2s. 6d. (for four lines). Longer Advertisements in proportion. A reduction made for a series. Particulars of **Mr. J. Herbert Tutt, 22, Francemary Road, Ladywell Road, Brockley, S.E.**

Subscribers who change their addresses must report the same to **Mr. H. E. Page, "Bertrose," Gellatly Road, St. Catherine's Park, London, S.E.,** otherwise their magazines will probably be delayed, also to **Mr. J. HERBERT TUTT, 22, Francemary Road, Ladywell Road, Brockley, S.E.**

Articles for insertion and Exchanges should be sent to **J. W. TUTT, Rayleigh Villa, Westcombe Hill, S.E.,** except notes relating to Coleoptera, which should be sent to **Mr. H. DONISTHORPE, 58, Kensington Mansions, South Kensington, S.W.,** and of Orthoptera, to **Mr. Burr, Easty S.O., Kent.**

Articles that require illustration are inserted on condition that the author defrays the cost of the illustrations.

All Exchange Magazines must be forwarded to **J. W. TUTT, Rayleigh Villa, Westcombe Hill Blackheath, S.E.**

The NEXT NUMBER will be Published on SEPTEMBER 15.

EXCHANGES.—The use of this column for the offer of "Duplicates" and "Desiderata" and "Changes of Address" is open free to subscribers so long as space is available.

Duplicates.—*Monacha and larvæ, ova of Tiliæ, *Gracilis (red var.), *Betulæ (males), Hyale, Edusa, Lunigera, Littoralis, Muralis, Corticea, Irrorella, Craccæ (fair), Orion, Strataria, Humiliata, Dealbata. Desiderata.—Larva of Caja (north of England), Lancashire wild larvæ or pupæ of Grossulariata in quantity.—**W. J. Ogden, 1, West Bank, Stamford Hill, London, N.**

WANTED.—Urgently for experimental purposes: Pupæ of Laponaria. Offered.—

Larvæ of blackish *Ditrapezium*, *Ashworthii*, *Leporina*, *Dictæoides*, *Albicillata*; fresh imagines of *Captiuncula*, *Salmacis*, *Olivata*, *Bicolorata* ab. *plumbata*, etc., etc.—*J. W. H. Harrison, 181, Abingdon Road, Middlesbro'*.

Duplicates.—*Complanella*, *Emberizæpennella*, *Coryli*, *Bremiella*, *Alnifoliella*, *Solitariella*, *Salicicolella*, *Spinolella*, *Lautella*, *Carpinicolella*, *Semidecandriella*, *Marginea*, *Pomifoliella*, *Cramerella*, *Maritima*, *Sylvella*, *Miscella*, *Stettinensis*, *Lantanella*, *Pfeifferella*, For any specimens useful in my cabinets. Will send marked list.—*J. A. Clark, 57, Weston Park, Crouch End, N.*

WANTED.—*Iris ova*. Cash, Exchange, &c. The only British species the egg of which is not photographed.—*A. E. Tonge, Aincroft, Surrey.*

WANTED.—Indian *Theclas*, *Chrysophanids*, and *Lycænids*. Offered—*Palæarctic* and *Nearctic* species.—*J. W. H. Harrison, 181, Abingdon Road, Middlesboro'*.

WANTED.—Good photographs or careful drawings of *Aberrations*, *Gynandromorpha*, etc., of any British "Blues," for reproduction in *The Natural History of the British Butterflies*. Also photos and good drawings of *Aberrations* and *Gynandromorpha* of other groups that may be used later as opportunity offers. [Specimens not necessarily British.] *J. W. Tutt, 119, Westcombe Hill, Blackheath.*

MEETINGS OF SOCIETIES.

Entomological Society of London.—11, Chandos Street, Cavendish Square, W., 8 p.m. Meetings—October 7th, 21st, November 4th, 18th, December 2nd.

The City of London Entomological and Natural History Society.—London Institution, Finsbury Circus, E.C.—The first and third Tuesdays in the month, at 7.30 p.m.; except in July and August.

Toynbee Hall Natural History Society.—Held at Toynbee Hall, Commercial Street, E., Mondays, at 8 p.m. Meetings—September 7th, Exhibition Meeting. [No meeting in August.] Excursions—July 26th, Rickmansworth; train 10.5 a.m., Baker Street. August 16th, Woking; train 10 a.m., Waterloo. September 5th, Hayes; train 2.27 p.m., Cannon Street. September 20th, Bookham; train 10.5 a.m., Waterloo.

The South London Entomological and Natural History Society, Hibernia Chambers, London Bridge.—The second and fourth Thursdays in each month, at 8 p.m. Field Meetings—July 25th, to Byfleet, S. Edwards and A. Sich; September 19th, to Claygate, H. J. Turner; October (date not fixed), Fungus Foray, E. Step.

North London Natural History Society, The Amherst Club, Amhurst Road, N.—Meetings. [No notices received.]

Lancashire and Cheshire Entomological Society.—Meetings at the Royal Institution, Liverpool, on the 3rd Monday in the month from October to April. Hon. Sec., H. R. Sweeting, 6, The Elms, Dingle, Liverpool.

Notes on the *Zygænidæ*.

By J. W. TUTT, F.E.S.

PRICE ONE SHILLING AND SIXPENCE.

(Containing an account of the newly-discovered British species.)

- Chapter I. *Zygaena evulans* and its varieties.
- Chapter II. *Zygaena carniolica* and its varieties.
- Chapter III. *Zygaena achilleae* and its varieties.
- Chapter IV. *Zygaena transalpina* and its varieties.
- Chapter V. *Zygaena medicaginis* and its varieties.
- Chapter VI. *Zygaena ochsenheimeri*.

Postal Orders to A. H., 41, Wisteria Road, Lewisham, S.E.

The Migration and Dispersal of Insects.

By J. W. TUTT, F.E.S.

Demy 8vo., 132 pp. Price Five Shillings net.

This book, the only one published on this interesting subject, is of first importance to all students of the geographical distribution of animals, and contains the following chapters:—

- 1. General Considerations. 2. Coccids and Aphides. 3. Orthoptera. 4. Odonata. 5. Lepidoptera. 6. Coleoptera. 7. Diptera. 8. Social Insects—Hymenoptera, Termites. 9. Final considerations.

Only a small number of copies have been printed. It is trusted that all entomologists will, besides supporting the book themselves, recommend it to any libraries in which they are interested or with which they are connected.

THE . . .

Natural History of the British Lepidoptera.

By J. W. TUTT, F.E.S.

Vol. IX.

Price £1 net.

Vol. IX of this Encyclopædic work has just been completed. It contains full and detailed accounts of the "Hairstreaks" and "Blue" butterflies, dealing in the most comprehensive manner with every phase of their life-history, variation, and distribution. The volume is divided into two sections, the General Chapters dealing with a variety of the phenomena attendant on the natural activities of butterfly larvæ; the second, the systematic description, biology and distribution of the species dealt with, and the discussion of the literature and characters of the families, subfamilies and genera to which the species belong, forming, as it were, a basis for the detailed consideration of the world-fauna.

There are now published—Vols. I-V and VIII-IX, the seven volumes forming a complete monographic revision of the species dealt with.

To new subscribers to the whole work the complete set of 7 volumes will be forwarded direct for **£6**. (If ordered through the booksellers, the price is **£1 net each volume**. Only those who send their names to Mr. J. Herbert Tutt as continuous subscribers can be supplied at this price and application must be to him direct.)

In spite of the apparent dearth of this work, it is in reality the *cheapest ever published*. Each volume averages more than 500 pages of solid Long Primer and Brevier, of demy 8vo. size; all the contents consisting of summarised detail, and without any superfluous padding. It is a book for students, who really want all the available information on the subject dealt with. It is the standard work in use among all the best scientific lepidopterists on the continent as well as in the British Islands, and is possibly more often referred to by workers on the Palearctic fauna than any other book in existence. It covers all the Continental work ever done on the groups treated, and not only gives the facts, but informs the student how to get at everything published on the subject he is reading.

The illustrations of the later volumes are quite unequalled. There are, in the volume now being published, full-page life-histories of each species, and detailed structural plates of egg, larvæ and larval hairs, spiracles, etc., pupæ and pupal hairs, spiracles, etc., and other items illustrating quite new discoveries in the structure of the early stages, etc.

The series of volumes forms indeed a standard work of reference, and any lepidopterist who possesses the volumes wants rarely to make reference to outside libraries for any detail, however unusual, on the subjects treated.

The general chapters, too, are summaries of everything known and published on the various subjects. The preliminary chapters, also, introducing each superfamily, cover the world-wide literature, and questions of classification and systematic entomology are discussed from the broad standpoint of the fauna of the world, and not from any restricted or limited point of view. The work, therefore, is one that appeals to all lepidopterists.

DEAR SIR,—

Please forward me Vol. IX of *The Natural History of British Lepidoptera*, for which I send herewith Cheque (or Postal Order) for **£1**.

Name.....

Address.....

Date.....

DEAR SIR,—Please forward me a set (7 vols.) of *The Natural History of British Lepidoptera*, for which I enclose Cheque (or Postal Order) for **£6**.

Name.....

Address.....

Mr. J. HERBERT TUTT,

22, Francemary Road, Ladywell Road, Brockley, S.E.

Practical Hints for the Field Lepidopterist (Illustrated.)

By J. W. TUTT, F.E.S.

PARTS I II & III

(Interleaved for Collector's own notes.)

Price 6s. each volume, net, or 17s. 6d. for the three parts.

Containing about 4000 Practical Hints of the form so well known.

Together with

General and Special Index to Parts I II & III.

(Containing references to nearly 1600 British species)

By H. J. TURNER, F.E.S.

Together with Chapters on

Preservation, Mounting, and Photographing of Eggs.

By F. NOAD CLARK AND A. E. TONGE, F.E.S.

Also detailed chapters on

"The Collection and Conservation of Lepidoptera," "Killing," "Pinning," "Entomological Pins," "Setting," "Labelling," "Holiday Collecting," "Collections," "Collecting," "The Egg and Egg Stage," "The Larva and Larval Stage," "The Pupa and Pupal Stage." Instructions on the technical description of "Eggs," "Larvæ," "Pupæ," etc.

The whole comprising the most important book on the subject ever offered to the field lepidopterist, and a complete encyclopædia of Field Lepidopterology.

Roughly, the number of species of lepidoptera in the whole British fauna amounts to about 2100 species. It was not until the three parts were carefully indexed by Mr. Turner that it was suspected how wide a field the "Hints" covered, and how comparatively few of the British species, other than the very commonest, received no "hint" as to their mode of capture in one or other of their stages. The long general index shows that the work is encyclopædic from the field lepidopterist's point of view; nothing so complete as the hints on sallowing, light, sugaring, egg-laying, larva-hunting (in all its forms), pupa-hunting, and the various phases of rearing lepidoptera—breeding-cages, treatment, food, etc.—having ever been attempted. In addition to these points, many chapters, simple enough for the beginner, and yet advanced enough to teach the expert something, have been added, with the intention of suggesting to the field lepidopterist how to use his observations and work, not only to his own advantage, but also to the advantage of entomological science, and the book can be recommended as being of first value to all field entomologists, whilst the chapters on the preservation, mounting, measurement, and photographing of eggs, will appeal to a very large class of entomologists.

DEAR SIR,—Please forward me a set of *Practical Hints*, Parts I, II, and III, for which I enclose Postal Order for **17s. 6d.**

Name.....

Address.....

To Mr. J. HERBERT TUTT, 22, Francemary Road, Ladywell Road, Brockley, S.E.

WATKINS & DONCASTER,

Naturalists and Manufacturers of Entomological Apparatus and Cabinets.

Plain Ring Nets, wire or cane, including Stick, 1/3, 2/-, 2/6, 3/-. Folding Nets, 3/6, 4/-, 4/6. Umbrella Nets (self-acting), 7/-. Pocket Boxes (deal), 6d., 9d., 1/-, 1/6. Zinc Collecting Boxes, 9d., 1/-, 1/6, 2/-. Nested Chip Boxes, 7d. per four dozen, 1 gross, 1/6. Entomological Pins, 1/6 per ounce. Pocket Lanterns, 2/6 to 8/-. Sugaring Tin, with brush, 1/6, 2/-. Sugaring Mixture, ready for use, 1/9 per tin. Store-Boxes, with camphor cells, 2/6, 4/-, 5/-, 6/-. Setting-Boards, flat or oval, 1in., 6d.; 1½in., 8d.; 2in., 10d.; 2½in., 1/-; 3½in., 1/4; 4in., 1/6; 5in., 1/10; Complete Set of fourteen Boards, 10/6. Setting Houses, 9/6, 11/6; corked back, 14/-. Zinc Larva Boxes, 9d., 1/-, 1/6. Breeding Cage, 2/6, 4/-, 5/-, 7/6. Coleopterist's Collecting Bottle, with tube, 1/6, 1/8. Botanical Cases, japanned double tin, 1/6 to 4/6. Botanical Paper, 1/1, 1/4, 1/9, 2/2 per quire. Insect Glazed Cases, 2/6 to 11/-. Cement for replacing Antennæ 4d. per bottle. Steel Forceps, 1/6, 2/-, 2/6 per pair. Cabinet Cork, 7 by 3½, best quality 1/6 per dozen sheets. Brass Chloroform Bottle, 2/6. Insect Lens, 1/- to 8/-. Glass-top and Glass-bottomed Boxes, from 1/- per dozen. Zinc Killing Box, 9d. to 1/-. Pupa Digger, in leather sheath, 1/9. Taxidermist's Companion, containing most necessary implements for skinning, 10/6. Scalpels, 1/3; Scissors, 2/- per pair; Eggdrills, 2d., 3d., 9d.; Blowpipes, 4d.; Artificial Eyes for Birds and Animals. Label-lists of British Butterflies, 2d.; ditto of Birds' Eggs, 2d., 3d., 6d.; ditto of Land and Fresh-water Shells, 2d. Useful Books on Insects, Eggs, etc.

THE WAND TELESCOPE NET (An innovation in Butterfly Nets).

We beg to call your attention to our new Telescopic Handle for butterfly nets. It is made entirely in brass, and is light and strong, and, moreover, it can be shut up to carry in small compass. A very compact pattern, effecting great saving in weight and bulk.

Prices—2 joints, 8/6; 3 joints, 9/6; 4 joints, 10/6.

Complete with cane folding ring and bag. We shall be pleased to send on application.

SHOW ROOM FOR CABINETS

Of every description of INSECTS, BIRDS' EGGS, COINS, MICROSCOPICAL OBJECTS, FOSSILS, &c.

Catalogue (100 pages) sent on application, post free.

LARGE STOCK OF INSECTS AND BIRDS' EGGS (British, European, and Exotic).

Birds, Mammals, etc., Preserved and Mounted by First-class Workmen.

Only address—**36, STRAND, LONDON, W.C. (5 doors from Charing Cross).**

OVA, LARVÆ, AND PUPÆ.

The Largest Breeder of Lepidoptera in the British Isles is

H. W. HEAD, Entomologist,
SCARBOROUGH.

Full List of Ova, Larvæ, and Pupæ, also Lepidoptera, Apparatus, Cabinets, etc., sent on application.

Many Rare British Species and Good Varieties for Sale.

Lantern Slides in Natural Colours.

LEPIDOPTERA & LARVÆ A SPECIALITY.

Photographed from life and true to Nature in every detail.

SLIDES OF BIRDS, WILD FLOWERS, &c.,

By same Colour Process.

LANTERN SLIDES MADE TO ORDER FROM ANY SPECIMEN OR COLOURED DRAWING.

**PHOTOS IN COLOUR OF LARVÆ, LIFE SIZE, ON IVORINE
TABLETS TO PIN IN THE CABINET.**

For List apply to—

CHARLES D. HEAD, 2, Mount Vernon, Dollymount, DUBLIN.

The Entomologist's Library.

By J. W. TUTT, F.E.S.

A Natural History of the British Lepidoptera, their world-wide variation and geographical distribution (*illustrated*).

(A text-book for Students and Collectors.)

Vols. I, II, III, IV, V and VIII, IX, Price £1 each volume, net. Demy 8vo., thick, strongly bound in cloth. Complete set of 7 vols., £6 net. The most concise and thorough work on Lepidoptera ever offered to the entomological public.

A Natural History of the British Butterflies, their world-wide variation and geographical distribution (*illustrated*).

(A text-book for Students and Collectors.)

Vol. I and II. Price one guinea each net. Vol. III in course of publication (Monthly parts, 1/-).

A detailed account of the biology and variation of each British species, and a consideration of the literature and classification of the Palearctic species.

A Natural History of the British Alucitides, their world-wide variation and geographical distribution.

(A text-book for Students and Collectors.)

Vol. I. Price one guinea net. (To be completed in two volumes.)

Full details of the life-history of every British species; full historical account of the group and its classification.

Migration and Dispersal of Insects. Demy 8vo. Price 5s. net.

A detailed account of the migration of the Aphides, Orthoptera, Odonata, Diptera, Coleoptera, Hymenoptera, and Lepidoptera.

Practical Hints for the Field Lepidopterist (*illustrated*).

Three parts, 6s. each net. Complete set, 17s. 6d. A detailed set of some 4000 practical hints. Full information for collecting, preserving, and using the material for scientific purposes.

The British Noctuæ and their Varieties. Complete in 4 volumes. 28s. per set net. Demy 8vo., strongly bound in cloth. Full account of the typical and all known described forms, with original descriptions.

Melanism and Melanochroism in British Lepidoptera.

Demy 8vo., bound in cloth. Price 5s. A full account of all the facts known bearing on the subject, and a closely reasoned explanation of probable causes.

100 Practical Hints on the British Eupitheciids. Price 1s.

A series of hints on the method of finding and rearing eggs, larvæ, pupæ and imagines of the "pugs."

Monograph of the British Pterophorina. Demy 8vo., 161 pp.

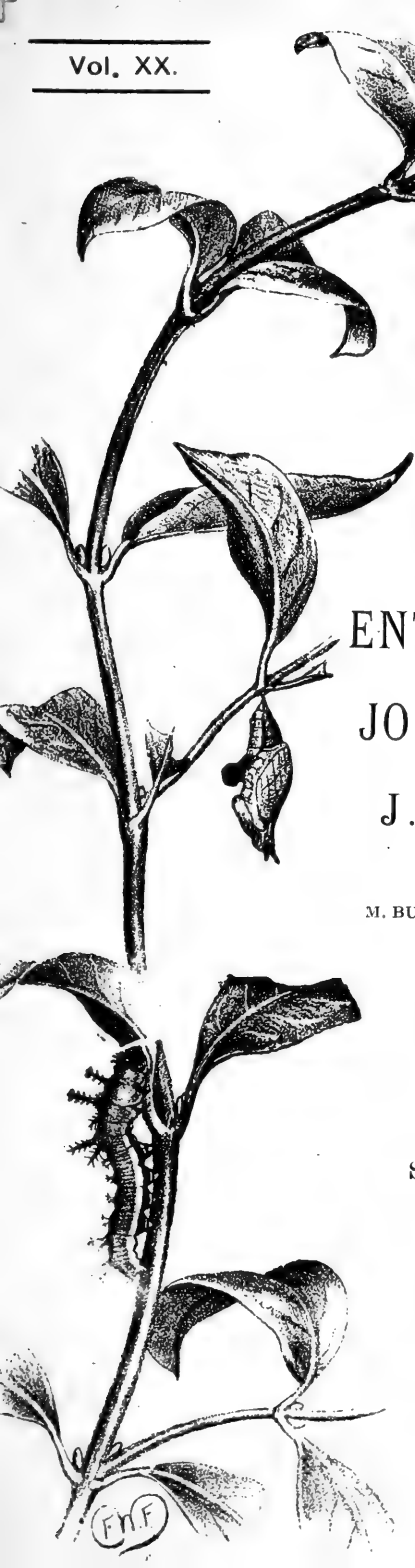
Bound in Cloth. Price 5s. net. An account of every British species and its life-history—each described under a series of detailed headings.

Rambles in Alpine Valleys. Crown 8vo. Bound in Cloth. With map and photographs. Price 3s. 6d. net. A graphic account of the rambles of a naturalist on the Italian side of Mont Blanc.

Woodside, Burnside, Hillside, and Marsh. Crown 8vo. Bound in Cloth. 242 pp. and 103 woodcuts and full-page illustrations. Price 2s. 6d. net. Descriptive account of well-known natural history localities (botanical, entomological, geological, ornithological), including Cobham, Cliffe, Cuxton, the Western Highlands, &c.

Random Recollections of Woodland, Fen, and Hill. Crown 8vo. Bound in Cloth. Price 3s. net. A detailed account of the fauna and flora of some well-known British natural history localities—Wicken, Deal, Chattenden, the Medway marshes, Freshwater, &c.

To be obtained from J. H. TUTT, 22, Francemary Road, Ladywell Road, Brockley, S.E., to whom Cheques and Postal Orders should be sent.



THE
ENTOMOLOGIST'S RECORD
AND
JOURNAL OF VARIATION
EDITED BY
J. W. TUTT, F.E.S.

ASSISTED BY

T. HUDSON BEARE, B.SC., F.E.S., F.R.S.E.
GEORGE T. BETHUNE-BAKER, F.Z.S., F.E.S.
M. BURR, B.A., F.Z.S., F.L.S., F.E.S. T. A. CHAPMAN, M.D., F.Z.S., F.E.S.
H. ST. J. K. DONISTHORPE, F.Z.R., F.E.S.
JAS. E. COLLIN, F.E.S.

SEPTEMBER 15th, 1908.

Price SIXPENCE (NET).

(WITH PLATE.)

Subscription for Complete Volume, post free
(including all DOUBLE NUMBERS, etc.)

SEVEN SHILLINGS

TO BE FORWARDED TO:

J. HERBERT TOTT

22, FRANCEMARY ROAD, LADYWELL ROAD, BROOKLEY, S.E.

LONDON:

ELLIOT STOCK, 62, PATERNOSTER ROW, E.C.

BERLIN:

R. FRIEDLÄNDER & SOHN,
11, CARLSTRASSE, N.W.



Immediate Annuities **With Return of Purchase Money**

IN EVENT OF EARLY DEATH.

For Particulars write . . .

GRESHAM LIFE ASSURANCE SOCIETY, LTD.

ST. MILDRED'S HOUSE, LONDON, E.C.

ASSETS EXCEED - £9,800,000.

JAMES H. SCOTT, *General Manager and Secretary.*

D. F. TAYLER & Co., Ltd.,
Entomological Pin Manufacturers,

SMALL HEADS AND PERFECT POINTS. WHITE, BLACK, AND GILT.

BIRMINGHAM and LONDON.

Can be obtained from Dealers throughout the World.

NEW FOREST BUTTERFLIES & MOTHS

Ova, Larvæ, Pupæ, and (bred) Imagines supplied to order by

G. TATE and SON,

Entomologists, Lyndhurst, New Forest.

Established 1870.

Instructions given in Practical Entomology. Correspondence invited.

LABELS! LABELS!! LABELS!!!

It is very essential that every specimen, to be authentic, should bear a minute label, giving locality, date of capture, and name of captor.

3000

{ To comprise equal numbers of not more than ten localities.
Larger quantities *pro rata*. Orders executed in same order as
received. Remittance in full must accompany each order.

5/-

Rannoch
16. vi. 97

New Forest
4. ix. 97

Shetland
5. v. 97

**ADDRESS.—“Requisites,” Coombe Lodge, Mycenæ Road,
Westcombe Park, S.E.**

Melanism and Melanochroism in British Lepidoptera

(Demy 8vo., bound in Cloth. Price 5/-.)

Deals exhaustively with all the views brought forward by scientists to account for the forms of melanism and melanochroism; contains full data respecting the distribution of melanic forms in Britain, and theories to account for their origin; the special value of “natural selection,” “environment,” “heredity,” “disease,” “temperature,” &c., in particular cases. Lord Walsingham, in his Presidential address to the Fellows of the Entomological Society of London, says, “An especially interesting line of enquiry as connected with the use and value of colour in insects is that which has been followed up in Mr. Tutt's series of papers on ‘Melanism and Melanochroism.’”

J. HERBERT TUTT, 22, Francemary Road, Ladywell Road, Brockley, S.E.

WATKINS & DONCASTER,

Naturalists and Manufacturers of Entomological Apparatus and Cabinets

Plain Ring Nets, wire or cane, including Stick, 1/3, 2/-, 2/6, 3/-. Folding Nets, 3/6, 4/-, 4/6. Umbrella Nets (self-acting), 7/-. Pocket Boxes (deal), 6d., 9d., 1/-, 1/6. Zinc Collecting Boxes, 9d., 1/-, 1/6, 2/-. Nested Chip Boxes, 7d. per four dozen, 1 gross, 1/6. Entomological Pins, 1/6 per ounce. Pocket Lanterns, 2/6 to 8/-. Sugaring Tin, with brush, 1/6, 2/-. Sugaring Mixture, ready for use, 1/9 per tin. Store-Boxes, with camphor cells, 2/6, 4/-, 5/-, 6/-. Setting-Boards, flat or oval, 1in., 6d.; 1½in., 8d.; 2in., 10d.; 2½in., 1/-; 3½in., 1/4; 4in., 1/6; 5in., 1/10; Complete Set of fourteen Boards, 10/6. Setting Houses, 9/6, 11/6; corked back, 14/-. Zinc Larva Boxes, 9d., 1/-, 1/6. Breeding Cage, 2/6, 4/-, 5/-, 7/6. Coleopterist's Collecting Bottle, with tube, 1/6, 1/8. Botanical Cases, japanned double tin, 1/6 to 4/6. Botanical Paper, 1/1, 1/4, 1/9, 2/2 per quire. Insect Glazed Cases, 2/6 to 11/-. Cement for replacing Antennæ 4d. per bottle. Steel Forceps, 1/6, 2/-, 2/6 per pair. Cabinet Cork, 7 by 3½, best quality 1/6 per dozen sheets. Brass Chloroform Bottle, 2/6. Insect Lens, 1/- to 8/-. Glass-top and Glass-bottomed Boxes, from 1/- per dozen. Zinc Killing Box, 9d. to 1/-. Pupa Digger, in leather sheath, 1/9. Taxidermist's Companion, containing most necessary implements for skinning, 10/6. Scalpels, 1/3; Scissors, 2/- per pair; Eggdrills, 2d., 3d., 9d.; Blowpipes, 4d.; Artificial Eyes for Birds and Animals. Label-lists of British Butterflies, 2d.; ditto of Birds' Eggs, 2d., 3d., 6d.; ditto of Land and Fresh-water Shells, 2d. Useful Books on Insects, Eggs, etc.

THE WAND TELESCOPE NET (An innovation in Butterfly Nets).

We beg to call your attention to our new Telescopic Handle for butterfly nets. It is made entirely in brass, and is light and strong, and, moreover, it can be shut up to carry in small compass. A very compact pattern, effecting great saving in weight and bulk.

Prices—2 joints, 8/6; 3 joints, 9/6; 4 joints, 10/6.

Complete with cane folding ring and bag. We shall be pleased to send on application.

SHOW ROOM FOR CABINETS

Of every description of INSECTS, BIRDS' EGGS, COINS, MICROSCOPICAL OBJECTS, FOSSILS, &c.

Catalogue (100 pages) sent on application, post free.

LARGE STOCK OF INSECTS AND BIRDS' EGGS (British, European, and Exotic).

Birds, Mammals, etc., Preserved and Mounted by First-class Workmen.

Only

Address **36, STRAND, LONDON, W.C. (5 doors from Charing Cross).**

OVA, LARVÆ, AND PUPÆ.

The Largest Breeder of Lepidoptera in the British Isles is

H. W. HEAD, Entomologist,
SCARBOROUGH.

Full List of Ova, Larvæ, and Pupæ, also Lepidoptera, Apparatus, Cabinets, etc., sent on application.

Many Rare British Species and Good Varieties for Sale.

Lantern Slides in Natural Colours.

LEPIDOPTERA & LARVÆ A SPECIALITY.

Photographed from life and true to Nature in every detail.

SLIDES OF BIRDS, WILD FLOWERS, &c.,

By same Colour Process.

LANTERN SLIDES MADE TO ORDER FROM ANY SPECIMEN OR COLOURED DRAWING.

**PHOTOS IN COLOUR OF LARVÆ, LIFE SIZE, ON IVORINE
TABLETS TO PIN IN THE CABINET.**

For List apply to—

CHARLES D. HEAD, 2, Mount Vernon, Dollymount, DUBLIN.

The Entomologist's Library.

By J. W. TUTT, F.E.S.

A Natural History of the British Lepidoptera, their world-wide variation and geographical distribution (*illustrated*).

(A text-book for Students and Collectors.)

Vols. I, II, III, IV, V and VIII, IX, Price £1 each volume, net. Demy 8vo., thick, strongly bound in cloth. Complete set of 7 vols., £6 net.

The most concise and thorough work on Lepidoptera ever offered to the entomological public.

A Natural History of the British Butterflies, their world-wide variation and geographical distribution (*illustrated*).

(A text-book for Students and Collectors.)

Vol. I and II. Price one guinea each net. Vol. III in course of publication (Monthly parts, 1/-).

A detailed account of the biology and variation of each British species, and a consideration of the literature and classification of the Palearctic species.

A Natural History of the British Alucitides, their world-wide variation and geographical distribution.

(A text-book for Students and Collectors.)

Vol. I. Price one guinea net. (To be completed in two volumes.)

Full details of the life-history of every British species; full historical account of the group and its classification.

Migration and Dispersal of Insects. Demy 8vo. Price 5s. net.

A detailed account of the migration of the Aphides, Orthoptera, Odonata, Diptera, Coleoptera, Hymenoptera, and Lepidoptera.

Practical Hints for the Field Lepidopterist (*illustrated*).

Three parts, 6s. each net. Complete set, 17s. 6d. A detailed set of some 4000 practical hints. Full information for collecting, preserving, and using the material for scientific purposes.

The British Noctuæ and their Varieties. Complete in 4 volumes.

28s. per set net. Demy 8vo., strongly bound in cloth. Full account of the typical and all known described forms, with original descriptions.

Melanism and Melanochroism in British Lepidoptera.

Demy 8vo., bound in cloth. Price 5s. A full account of all the facts known bearing on the subject, and a closely reasoned explanation of probable causes.

100 Practical Hints on the British Eupitheciids. Price 1s.

A series of hints on the method of finding and rearing eggs, larvæ, pupæ and imagines of the "pugs."

Monograph of the British Pterophorina. Demy 8vo., 161 pp.

Bound in Cloth. Price 5s. net. An account of every British species and its life-history—each described under a series of detailed headings.

Rambles in Alpine Valleys. Crown 8vo. Bound in Cloth. With map

and photographs. Price 3s. 6d. net. A graphic account of the rambles of a naturalist on the Italian side of Mont Blanc.

Woodside, Burnside, Hillside, and Marsh. Crown 8vo. Bound

in Cloth. 242 pp. and 103 woodcuts and full-page illustrations. Price

2s. 6d. net. Descriptive account of well-known natural history localities (botanical, entomological, geological, ornithological), including Cobham, Cliffe, Cuxton, the Western Highlands, &c.

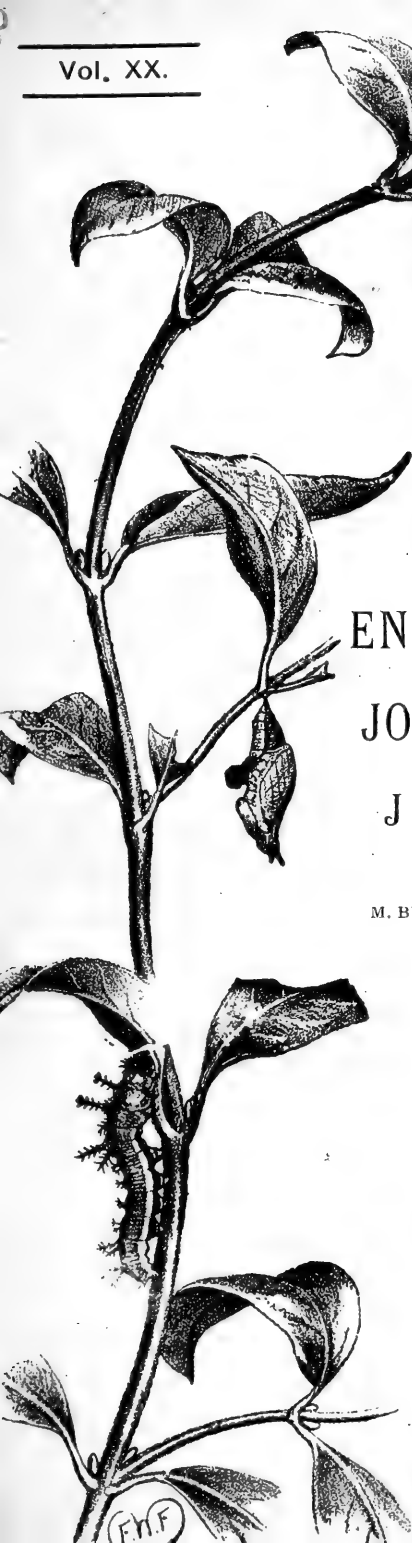
Random Recollections of Woodland, Fen, and Hill. Crown

8vo. Bound in Cloth. Price 3s. net. A detailed account of the fauna

and flora of some well-known British natural history localities—Wicken,

Deal, Chattenden, the Medway marshes, Freshwater, &c.

To be obtained from J. H. TUTT, 22, Francemary Road, Ladywell Road, Brockley, S.E., to whom Cheques and Postal Orders should be sent.



THE
ENTOMOLOGIST'S RECORD
AND
JOURNAL OF VARIATION
EDITED BY
J. W. TUTT, F.E.S.

ASSISTED BY

T. HUDSON BEARE, B.SC., F.E.S., F.R.S.E.
GEORGE T. BETHUNE-BAKER, F.Z.S., F.L.S., F.E.S.
M. BURR, B.A., F.Z.S., F.L.S., F.E.S. T. A. CHAPMAN, M.D., F.Z.S., F.E.S.
H. ST. J. K. DONISTHORPE, F.Z.S., F.E.S.
JAS. E. COLLIN, F.E.S. ALFRED SICH, F.E.S.

OCTOBER 15th, 1908.

Price SIXPENCE (NET).

(WITH PLATE.)

Subscription for Complete Volume, post free
(Including all DOUBLE NUMBERS, etc.)

SEVEN SHILLINGS

TO BE FORWARDED TO

J. HERBERT TUTT, 1909

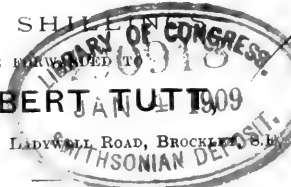
22, FRANCIS ROAD, LADY WALK ROAD, BROCKLEY, S.E.

LONDON:

ELLIOT STOCK, 62, PATERNOSTER ROW, E.C.

BERLIN:

R. FRIEDLÄNDER & SOHN,
11, CARLSTRASSE, N.W.



Immediate Annuities **With Return of Purchase Money**

IN EVENT OF EARLY DEATH.

For Particulars write . . .

GRESHAM LIFE ASSURANCE SOCIETY, LTD.

ST. MILDRED'S HOUSE, LONDON, E.C.

ASSETS EXCEED - £9,800,000.

JAMES H. SCOTT, *General Manager and Secretary.*

D. F. TAYLER & Co., Ltd., **Entomological Pin Manufacturers,**

SMALL HEADS AND PERFECT POINTS. WHITE, BLACK, AND GILT.

BIRMINGHAM and LONDON.

Can be obtained from Dealers throughout the World.

NEW FOREST BUTTERFLIES & MOTHS

Ova, Larvæ, Pupæ, and (bred) Imagines supplied to order by

G. TATE and SON,

Entomologists, Lyndhurst, New Forest.

Established 1870.

Instructions given in Practical Entomology. Correspondence invited.

LABELS ! LABELS !! LABELS !!!

It is very essential that every specimen, to be authentic, should bear a minute label, giving locality, date of capture, and name of captor.

3000	{	To comprise equal numbers of not more than ten localities.	5/-	
		Larger quantities <i>pro rata</i> . Orders executed in same order as received. Remittance in full must accompany each order.		
		Rannoch 16. vi. 97	New Forest 4. ix. 97	Shetland 5. v. 97

**ADDRESS.—“Requisites,” Coombe Lodge, Mycenæ Road,
Westcombe Park, S.E.**

Melanism and Melanochroism in British Lepidoptera

(Demy 8vo., bound in Cloth. Price 5/-.)

Deals exhaustively with all the views brought forward by scientists to account for the forms of melanism and melanochroism; contains full data respecting the distribution of melanic forms in Britain, and theories to account for their origin; the special value of “natural selection,” “environment,” “heredity,” “disease,” “temperature,” &c., in particular cases. Lord Walsingham, in his Presidential address to the Fellows of the Entomological Society of London, says, “An especially interesting line of enquiry as connected with the use and value of colour in insects is that which has been followed up in Mr. Tutt’s series of papers on ‘Melanism and Melanochroism.’”

J. HERBERT TUTT, 22, Francemary Road, Ladywell Road, Brockley, S.E.

WATKINS & DONCASTER,

Naturalists and Manufacturers of Entomological Apparatus and Cabinets

Plain Ring Nets, wire or cane, including Stick, 1/3, 2/-, 2/6, 3/-, 4/-, 4/6. Umbrella Nets (self-acting), 7/-. Pocket Boxes (deal), 6d., 9d., 1/-, 1/6. Zinc Collecting Boxes, 9d., 1/-, 1/6, 2/-. Nested Chip Boxes, 7d. per four dozen, 1 gross, 1/6. Entomological Pins, 1/6 per ounce. Pocket Lanterns, 2/6 to 8/-. Sugaring Tin, with brush, 1/6, 2/-. Sugaring Mixture, ready for use, 1/9 per tin. Store-Boxes, with camphor cells, 2/6, 4/-, 5/-, 6/-. Setting-Boards, flat or oval, 1in., 6d.; 1½in., 8d.; 2in., 10d.; 2½in., 1/-; 3½in., 1/4; 4in., 1/6; 5in., 1/10; Complete Set of fourteen Boards, 10/6. Setting Houses, 9/6, 11/6; corked back, 14/-. Zinc Larva Boxes, 9d., 1/-, 1/6. Breeding Cage, 2/6, 4/-, 5/-, 7/6. Coleopterist's Collecting Bottle, with tube, 1/6, 1/8. Botanical Cases, japanned double tin, 1/6 to 4/6. Botanical Paper, 1/1, 1/4, 1/9, 2/2 per quire. Insect Glazed Cases, 2/6 to 11/-. Cement for replacing Antennæ 4d. per bottle. Steel Forceps, 1/6, 2/-, 2/6 per pair. Cabinet Cork, 7 by 3½, best quality 1/6 per dozen sheets. Brass Chloroform Bottle, 2/6. Insect Lens, 1/- to 8/-. Glass-top and Glass-bottomed Boxes, from 1/- per dozen. Zinc Killing Box, 9d. to 1/-. Pupa Digger, in leather sheath, 1/9. Taxidermist's Companion, containing most necessary implements for skinning, 10/6. Scalpels, 1/3; Scissors, 2/- per pair; Eggdrills, 2d., 3d., 9d.; Blowpipes, 4d.; Artificial Eyes for Birds and Animals. Label-lists of British Butterflies, 2d.; ditto of Birds' Eggs, 2d., 3d., 6d.; ditto of Land and Fresh-water Shells, 2d. Useful Books on Insects, Eggs, etc.

THE WAND TELESCOPE NET (An innovation in Butterfly Nets).

We beg to call your attention to our new Telescopic Handle for butterfly nets. It is made entirely in brass, and is light and strong, and, moreover, it can be shut up to carry in small compass. A very compact pattern, effecting great saving in weight and bulk.

Prices—2 joints, 8/6; 3 joints, 9/6; 4 joints, 10/6.

Complete with cane folding ring and bag. We shall be pleased to send on application.

SHOW ROOM FOR CABINETS

Of every description of INSECTS, BIRDS' EGGS, COINS, MICROSCOPICAL OBJECTS, FOSSILS, &c.

Catalogue (100 pages) sent on application, post free.

LARGE STOCK OF INSECTS AND BIRDS' EGGS (British, European, and Exotic).

Birds, Mammals, etc., Preserved and Mounted by First-class Workmen.

Only address—**36, STRAND, LONDON, W.C. (5 doors from Charing Cross).**

OVA, LARVÆ, AND PUPÆ.

The Largest Breeder of Lepidoptera in the British Isles is

H. W. HEAD, Entomologist,
SCARBOROUGH.

Full List of Ova, Larvae, and Pupae, also Lepidoptera, Apparatus, Cabinets, etc., sent on application.

Many Rare British Species and Good Varieties for Sale.

Lantern Slides in Natural Colours.

LEPIDOPTERA & LARVÆ A SPECIALITY.

Photographed from life and true to Nature in every detail.

SLIDES OF BIRDS, WILD FLOWERS, &c.,

By same Colour Process.

LANTERN SLIDES MADE TO ORDER FROM ANY SPECIMEN OR COLOURED DRAWING.

**PHOTOS IN COLOUR OF LARVÆ, LIFE SIZE, ON IVORINE
TABLETS TO PIN IN THE CABINET.**

For List apply to—

CHARLES D. HEAD, 2, Mount Vernon, Dollymount, DUBLIN.

The Entomologist's Library.

By J. W. TUTT, F.E.S.

A Natural History of the British Lepidoptera, their world-wide variation and geographical distribution (*illustrated*).

(A text-book for Students and Collectors.)

Vols. I, II, III, IV, V and VIII, IX, Price £1 each volume, net. Demy 8vo., thick, strongly bound in cloth. Complete set of 7 vols., £6. net. The most concise and thorough work on Lepidoptera ever offered to the entomological public.

A Natural History of the British Butterflies, their world-wide variation and geographical distribution (*illustrated*).

(A text-book for Students and Collectors.)

Vol. I and II. Price one guinea each net. Vol. III in course of publication (Monthly parts, 1/-).

A detailed account of the biology and variation of each British species, and a consideration of the literature and classification of the Palearctic species.

A Natural History of the British Alucitides, their world-wide variation and geographical distribution.

(A text-book for Students and Collectors.)

Vol. I. Price one guinea net. (To be completed in two volumes.)

Full details of the life-history of every British species; full historical account of the group and its classification.

Migration and Dispersal of Insects. Demy 8vo. Price 5s. net.

A detailed account of the migration of the Aphides, Orthoptera, Odonata, Diptera, Coleoptera, Hymenoptera, and Lepidoptera.

Practical Hints for the Field Lepidopterist (*illustrated*).

Three parts, 6s. each net. Complete set, 17s. 6d. A detailed set of some 4000 practical hints. Full information for collecting, preserving, and using the material for scientific purposes.

The British Noctuæ and their Varieties. Complete in 4 volumes. 28s. per set net. Demy 8vo., strongly bound in cloth. Full account of the typical and all known described forms, with original descriptions.

Melanism and Melanochroism in British Lepidoptera.

Demy 8vo., bound in cloth. Price 5s. A full account of all the facts known bearing on the subject, and a closely reasoned explanation of probable causes.

100 Practical Hints on the British Eupitheciids. Price 1s.

A series of hints on the method of finding and rearing eggs, larvæ, pupæ and imagines of the "pugs."

Monograph of the British Pterophorina. Demy 8vo., 161 pp.

Bound in Cloth. Price 5s. net. An account of every British species and its life-history—each described under a series of detailed headings.

Rambles in Alpine Valleys. Crown 8vo. Bound in Cloth. With map and photographs. Price 3s. 6d. net. A graphic account of the rambles of a naturalist on the Italian side of Mont Blanc.

Woodside, Burnside, Hillside, and Marsh. Crown 8vo. Bound in Cloth. 242 pp. and 103 woodcuts and full-page illustrations. Price 2s. 6d. net. Descriptive account of well-known natural history localities (botanical, entomological, geological, ornithological), including Cobham, Cliffe, Cuxton, the Western Highlands, &c.

Random Recollections of Woodland, Fen, and Hill. Crown 8vo. Bound in Cloth. Price 3s. net. A detailed account of the fauna and flora of some well-known British natural history localities—Wicken, Deal, Chattenden, the Medway marshes, Freshwater, &c.

Orders to be addressed to J. HERBERT TUTT, 22, Francemary Road, Ladywell Road, Brockley, S.E.

Charles Oberthür
Etudes d'Entomologie.

Faunes Entomologiques. Description d'Insectes nouveaux ou peu connus.

21 Livraisons avec 148 planches dont 128 coloriées soigneusement
à la main. 1876—1902, in-Quarto.

Mark 1000,—

Diese »E t u d e s« bieten Abbildungen und Beschreibungen neuer oder noch nicht abgebildeter seltener exotischer Lepidopteren. Durch die Schönheit und Naturtreue der handkolorierten Tafeln zählen sie zu den hervorragendsten entomologischen Publikationen und waren bereits seit Jahren teilweise vergriffen.

Durch Gewinnung eines äusserst geschickten französischen Künstlers sind wir in der Lage, jetzt wieder tadellose, unter Aufsicht des Verfassers hergestellte, vollständige Exemplare der »Etudes« zu liefern. Es stehen aber nur 7 vollständige Reihen zur Verfügung.

Inhalt und Einzelpreise:

Livraison I: Etude sur la Faune des Lépidoptères de l'Algérie. 1876. 74 pg. av. 4 plchs. color.

II: Espèces nouvelles de Lépidoptères recueillis en Chine par l'abbé A. David. 1876. 34 pg. av. 4 plchs. color.

III: Etude sur la Faune des Lépidoptères de la côte orientale d'Afrique. 1878. 48 pg. av. 4 plchs. color. **M. 30,—**

IV: Catalogue raisonné des Papilionidae de la collection de Ch. Oberthür à Rennes. 1880. 117 pg. av. 6 plchs. color. **M. 45,—**

V: Faune des Lépidoptères de l'île Askold. Partie I. 1880. 88 pg. av. 9 plchs. color.

VI: Lépidoptères de Chine. Lépid. d'Amérique. Lépid. d'Algérie. Le genre Ecpantheria. 1884. 115 pg. av. 20 plchs. color.

VII: Hépalides nouveaux d'Europe. Lépidoptères de l'Amérique méridionale. 1883. 36 pg. av. 3 plchs. color. **M. 22,—**

VIII: Observations sur les Lépidoptères des Pyrénées. 1884. 51 pg. av. 1 pche. color.

IX: Lépidoptères du Thibet, de la Mantschourie, de l'Asie mineure et de l'Algérie. 1884. 40 pg. av. 3 plchs. color. **M. 24,—**

X: Lépidoptères de l'Asie orientale. 1884. 35 pg. av. 3 plchs. color.

XI: Espèces nouvelles de Lépidoptères du Thibet. 1887. 38 pg. av. 7 plchs. color.

XII: Nouveaux Lépidoptères d'Afrique et d'Amérique. Premiers états de Lépidoptères de la Réunion. Lépidoptères Européens et Algériens. 1888. 55 pg. av. 7 plchs. color.

XIII: Lépidoptères des Iles Comores, d'Algérie et du Thibet. 1890. 50 pg. av. 10 plchs. color. **M. 82,—**

XIV: Lépidoptères du genre Parnassius. 1894. 49 pg. av. 3 plchs. color.

XV: Nouveaux Lépidoptères d'Asie (Chine, Yunnan, Hindostan). 1894. 27 pg. av. 3 plchs. color. **M. 34,—**

XVI: Lépidoptères du Pérou, du Thibet et du Yunnan. 1892. 49 pg. av. 2 plchs. color.

XVII: Lépidoptères de l'Asie et d'Afrique. 1893. 44 pg. av. 3 plchs. color.

XVIII: Lépidoptères d'Afrique. Lépidoptères d'Asie. 1894. 57 pg. av. 10 plchs. dont 6 color.

XIX: Lépidoptères d'Europe, d'Algérie, d'Asie et d'Océanie. 54 pg. av. 8 pl. color. et 2 plchs. (doubles) noires.

XX: De la Variation chez les Insectes. 1896. 20 et 74 pg. av. 23 fig. dans le texte et 24 plchs. dont 10 (av. 180 fig.) color. et 14 (av. 275 fig.) en photocollogr.

XXI: Variation des Heliconia Thelxiope et Vesta. 1902. 26 pg. av. 11 plchs. color. (132 fig.).

Nur Livr. III, IV, VII, IX, XIII, XV, XX, XXI sind noch einzeln käuflich zu obigen Preisen.

Charles Oberthür

Etudes de Lépidoptérologie comparée.

Fascicule I. 1904. 77 pg., gr. in-8., et 6 planches (61 figures) coloriées à la main. **M. 25.—**

Fascicule II. 1906. 44 pg., gr. in-8., et 3 planches (17 figures) chromolithogr. **M. 14.—**

Diese neue Reihe lepidopterologischer Studien behandelt besonders Hybriden und geographische Variationen, sowie die Gesetze, von denen die Entstehung solcher Abarten bedingt ist. Während das 1. Heft hauptsächlich europäisches Material behandelt und 64 mit der Hand meisterhaft colorierte Abbildungen bietet, enthält das 2. Heft besonders Beobachtungen an Exoten, die in 17 Figuren mittels Farbendruck äusserst naturgetreu dargestellt sind.

Dr. O. Staudinger und Dr. H. Rebel,

Catalog der Lepidopteren

des

Palaearctischen Faunengebietes.

Dritte Auflage

des Cataloges der Lepidopteren des Europäischen Faunengebietes.

2 Theile in einem Bande. 1901.

(I. Fam. Papilionidae — Hepialidae, von Dr. O. Staudinger und Dr. H. Rebel.

II. Fam. Pyralidae — Micropterygidae, von Dr. H. Rebel.)

XXXII, 411 und 368 Seiten, gross-Octav,
mit dem Bildnis Dr. O. Staudinger's in Lichtdruck.

Preis in Leinwand gebunden: 16 Mark.

broschirt: 15 Mark.

Als Sonderdruck aus dem „Catalog der Lepidopteren“ wird abgegeben:

Index der Familien und Gattungen — Index der Varietäten, Aberrationen und deren Synonyme.

102 Seiten gross-Octav. — Preis 2 Mark.

! Eine willkommene Ergänzung zu Staudinger-Rebel's Catalog !

C. v. Hormuzaki

Analytische Uebersicht der paläarktischen Lepidopteren-Familien.

1904. 68 Seiten, Gross-Oktav, mit 45 Textfiguren (Flügelgeäder).

Preis 2 Mark.

Inhalt: Einleitung. — Einiges über die Bezeichnung des Flügelgeäders und sonstige morphologische Terminologie. — Analytische Tabelle.

Mémoires sur les Lépidoptères

rédigés par N. M. Romanoff.

9 volumes, avec 4 cartes et 164 planches coloriées à la main. 1884—1901,
in-Quarto. — Mark 515,—

Inhalt und Einzelpreise:

Tome I. 1884. 181 pg. avec 10 planches coloriées et 1 carte. pas séparément.

Inhalt: Romanoff, Les Lépidoptères de la Transcaucasie. I. partie. — Christoph, Lepidoptera a. d. Achal-Tekke-Gebiete. I. Teil. — Staudinger, Beitrag zur Kenntnis der Lepidopterenfauna d. Achal-Tekke-Gebietes. — Snellen, Un nouveau genre de Pyralides. — Grumm-Grshimaïlo, Lepidopterol. Mitteilungen. — Table alphabétique.

Tome II. 1885. 262 pg. avec 16 planches coloriées.

M. 40,—

Inhalt: Romanoff, Les Lépidoptères de la Transcaucasie. II. partie. — Christoph, Lepidoptera a. d. Achal-Tekke-Gebiete. II. Teil. — Heylaerts, Description d'un genre nouveau et d'une espèce nouvelle appartenant aux Cossina H. S. — Heylaerts, Psychides nouvelles ou moins connues de l'Empire Russe. — Snellen, Description d'un nouveau genre de Pyralides. — Christoph, Schmetterlinge aus Nord-Persien. — Erschoff, Verzeichnisse von Schmetterlingen aus Central-Sibirien. — Grumm-Grshimaïlo, Bericht über meine Reise in das Alai-Gebiet. — Table alphabétique.

Tome III. 1887. 419 pg. avec 17 planches et 2 cartes coloriées. M. 50,—

Inhalt: Romanoff, Les Lépidoptères de la Transcaucasie. III. partie. — Christoph, Lepidoptera a. d. Achal-Tekke-Gebiete. III. Teil. — Staudinger, Neue Arten und Varietäten von Lepidopteren aus d. Amur-Gebiete. — Fixsen, Lepidoptera aus Korea. — Grumm-Grshimaïlo, Bericht über meine Reise in das östliche Buchara. (Correspondenz.) Nebst Anhang: Diagnosen einiger neuer Species. — Alphéraky, S., Diagnoses de quelques Lépidoptères inédits du Thibet. — Table alphabétique.

Tome IV. 1890. 584 pg. avec 22 planches coloriées et 1 carte. M. 80,—

Inhalt: Grumm-Grshimaïlo, Le Pamir et sa Faune lépidoptérologique.

Tome V. 1889. 248 pg. avec 12 planches coloriées.

M. 40,—

Inhalt: Christoph, Lepidoptera aus d. Achal-Tekke-Gebiete. IV. Teil. — Alphéraky, Lépidoptères rapportés du Thibet par le Général N. M. Przewalsky de son voyage de 1884—85. — Alphéraky, Lépidoptères rapportés de la Chine et de la Mongolie par G. N. Potanine. — Alphéraky, Le Pamir et sa Faune lépidoptérologique. Seconde Partie (spéciale) IV. Noctuérites. — Christoph, Neue Lepidopteren aus dem Kaukasus. — Alphéraky, Zur Lepidopteren-Fauna von Teneriffa. — Alphéraky, Sur quelques Lépidoptères de la Russie méridionale. — Table alphabétique.

Tome VI. 1892. 700 pg. avec 16 planches coloriées.

M. 60,—

Inhalt: Alphéraky, Lépidoptères rapportés de la Chine et de la Mongolie par G. N. Potanine. II. — Erschoff, Verzeichnis von Schmetterlingen aus Central-Sibirien. — Standfuss, Lepidopterologisches. — Staudinger, Die Macrolepidopteren des Amurgebiets. I. — Table alphabétique.

Tome VII—VIII. 1893—1901. 714 et 616 pg. avec 57 planches coloriées. M. 155,—

Inhalt: Ragonot, Monographie des Phycitinae et des Galleriinae.

Tome IX. 1897. 365 pg. avec 14 planches coloriées.

M. 48,—

Inhalt: Alphéraky, Lépidoptères rapportés par Mr. Gr. Groum-Grshimaïlo de l'Asie Centrale en 1889—1890. Lépidoptères des provinces chinoises Sé-Tchouen et Kham recueillis, en 1893, par Mr. G. N. Potanine. Lépidoptères de l'Amour et de la Corée. Mémoire sur différents Lépidoptères, tant nouveaux que peu connus, de la Faune paléarctique. Sur quelques Lépidoptères rapportés de l'Asie, en 1893—95, par l'expédition de Mssrs. Roborowsky et Kozlov. Lepidopteren aus Kamtschatka, gesammelt von O. Herz. — Herz, Reise von Jakutsk nach Kamtschatka im Jahre 1890. Table alphabétique.

J. Hübner

Sammlung Europäischer Schmetterlinge

nebst Fortsetzung von C. Geyer.

1805—41. 790 colorirte Kupfertafeln in-4.

Preis 900 Mark.

G. Herrich-Schäffer

**Systematische Bearbeitung der Schmetterlinge
von Europa.**

6 Bände Text mit 36 Umrisstafeln
und 636 colorirten Kupfertafeln. 1843—56. gross-4.

Preis 900 Mark.

Daraus einzeln die 6 Textbände

(— als Text, Revision und Supplement zu J. Hübner's Sammlung
europäischer Schmetterlinge —)

in gross-4., mit 36 Umrisstafeln, 1843—56.

Ausserordentlich ermässigten Preis 20 Mark.

Neue Schmetterlinge aus Europa.

3 Hefte mit 26 colorirten Kupfertafeln (soviel als erschienen).

1856—61. gross-4.

Preis 50 Mark.

Lepidoptera exotica nova.

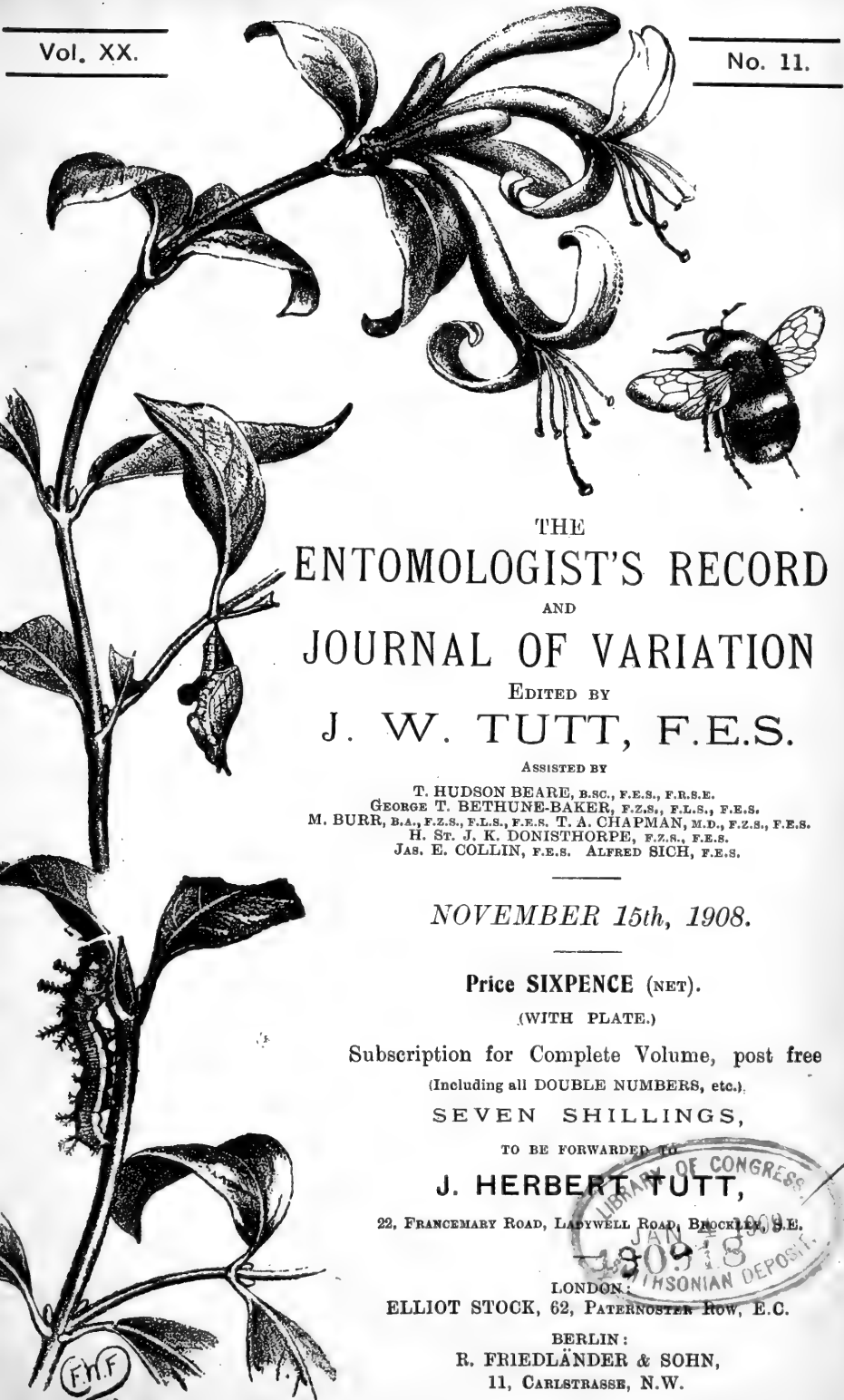
**Sammlung neuer oder wenig bekannter
aussereuropäischer Schmetterlinge.**

Band I und II, Lieferung 1, mit 129 colorirten Kupfertafeln,
soviel als erschienen. 1850—69. gross-4.

Preis 300 Mark.

Zu beziehen von

R. Friedländer & Sohn. Berlin N.W. 6. Karlstrasse 11.



THE
ENTOMOLOGIST'S RECORD
AND
JOURNAL OF VARIATION
EDITED BY
J. W. TUTT, F.E.S.

ASSISTED BY

T. HUDSON BEARE, B.SC., F.E.S., F.R.S.E.
GEORGE T. BETHUNE-BAKER, F.Z.S., F.L.S., F.E.S.
M. BURR, B.A., F.Z.S., F.L.S., F.E.S. T. A. CHAPMAN, M.D., F.Z.S., F.E.S.
H. ST. J. K. DONISTHORPE, F.Z.S., F.E.S.
JAS. E. COLLIN, F.E.S. ALFRED SICH, F.E.S.

NOVEMBER 15th, 1908.

Price SIXPENCE (NET).

(WITH PLATE.)

Subscription for Complete Volume, post free
(Including all DOUBLE NUMBERS, etc.).

SEVEN SHILLINGS,

TO BE FORWARDED TO

J. HERBERT TUTT,

22, FRANCIS ROAD, LADYWELL ROAD, BROCKLEY, S.E.

LONDON:

ELLIOT STOCK, 62, PATERNOSTER ROW, E.C.

BERLIN:

R. FRIEDLÄNDER & SOHN,

11, CARLSTRASSE, N.W.



Immediate Annuities **With Return of Purchase Money**

IN EVENT OF EARLY DEATH.

For Particulars write . . .

GRESHAM LIFE ASSURANCE SOCIETY, LTD.

ST. MILDRED'S HOUSE, LONDON, E.C.

ASSETS EXCEED - £9,800,000.

JAMES H. SCOTT, *General Manager and Secretary.*

D. F. TAYLER & Co., Ltd., **Entomological Pin Manufacturers,**

SMALL HEADS AND PERFECT POINTS. WHITE, BLACK, AND GILT.

BIRMINGHAM and LONDON.

Can be obtained from Dealers throughout the World.

NEW FOREST BUTTERFLIES & MOTHS

Ova, Larvæ, Pupæ, and (bred) Imagines supplied to order by

G. TATE and SON,

Entomologists, Lyndhurst, New Forest.

Established 1870.

Instructions given in Practical Entomology. Correspondence invited.

LABELS ! LABELS !! LABELS !!!

It is very essential that every specimen, to be authentic, should bear a minute label, giving locality, date of capture, and name of captor.

3000	{	To comprise equal numbers of not more than ten localities.	}	5/-
		Larger quantities <i>pro rata</i> . Orders executed in same order as received. Remittance in full must accompany each order.		
		Rannoch 14. vi. 97	New Forest 4. ix. 97	Shetland 5. v. 97

**ADDRESS.—“Requisites,” Coombe Lodge, Mycenæ Road,
Westcombe Park, S.E.**

The Migration and Dispersal of Insects. **By J. W. TUTT, F.E.S.**

Demy 8vo., 132 pp. Price Five Shillings net.

This book, the only one published on this interesting subject, is of first importance to all students of the geographical distribution of animals, and contains the following chapters:—

1. General Considerations. 2. Coccids and Aphides. 3. Orthoptera. 4. Odonata. 5. Lepidoptera. 6. Coleoptera. 7. Diptera. 8. Social Insects—Hymenoptera, Termites. 9. Final considerations.

Only a small number of copies have been printed. It is trusted that all entomologists will, besides supporting the book themselves, recommend it to any libraries in which they are interested or with which they are connected.

J. HERBERT TUTT, 22, Francemary Road, Ladywell Road, Brockley, S.E.

SPLENDID ! THANKS ! !

One does not hear this or a similar expression of glad feeling as often as one could wish, and its absence is frequently due to man's dilatoriness in exercising a proper care for his health. The habit of procrastination is strong in human nature. A slight indisposition—a feeling of being a bit "below par"—is given very little heed to, with the result that alarming symptoms often ensue. It is a truism that most sickness takes its rise in Indigestion, or a torpid state of the Liver and Bowels—conditions where

BEECHAM'S PILLS

may be depended upon with absolute confidence to effect a cure. Therefore, never permit the trouble to gain a hold upon your constitution—check it at the outset. Whether it be a case of Indigestion, Biliousness, Constipation, or an Anæmic and impure state of the blood, you should at once set about fortifying yourself by entering upon a course of BEECHAM'S PILLS. All sensations of depression and undue fatigue will disappear, your energies will speedily revive, you will regain all your lost vigour, and ere long you will join with tens of thousands in saying that, for "putting one right," BEECHAM'S PILLS

DESERVE ALL PRAISE.

Prepared only by **THOMAS BEECHAM, St. Helens, Lancs.**

Sold everywhere in boxes, price 1/1½ (56 pills) & 2/9 (168 pills.)

BRITISH MACRO LEPIDOPTERA

October 27th, at 12.30.

Mr. J. C. Stevens,

will offer at his rooms—38, KING STREET, COVENT GARDEN, W.C.

. . . THE LARGE AND VALUABLE . . .

Collection of Macro Lepidoptera

Formed by the late—

W. H. E. THORNTHWAITTE, Esq., F.E.S.

Together with some Entomological Books.

The Collection is contained in four large and one small Cabinets, and contains many rare and local species, among others *Heliothis scutosa* (Ent., ix., p. 18), *Noctua flammatrix* (Ent., ix., p. 18), *Leucania extranea*, *Agrotis subrosea*, *Thalpocharis ostrina*, *Chrysophanus dispar*, etc. Catalogues in course of preparation.

NOTICE TO LIBRARIANS AND OTHERS.

BRITISH NOCTUÆ AND THEIR VARIETIES, Vols.I.-IV.

A complete set (good as new) at the reduced price of **22/-**.

Also a set of

THE NATURAL HISTORY OF THE BRITISH LEPIDOPTERA,

Vols. I.-V. and IX.-X. for **£5** (£2 less than published price), or

Vols. I.-V. for **£3 3s.** (£1 17s. less than published price).

Address—A. H., 41, Wisteria Road, Lewisham, S.E.

Subscriptions for Vol. XX (7 shillings) should be sent to J. Herbert Tutt, 22, Francemary Road, Ladywell Road, Brockley, S.E. Will subscribers please oblige? [This subscription includes all numbers published from January 15th to December 15th, 1908.]

Non-receipt or errors in the sending of Subscribers' magazines should be notified to Mr. H. E. Page, "Bertrose," Gellatly Road, Hatcham, S.E.

NOTICE.

The Back Volumes (I-XIX) of *The Entomologist's Record*, &c., can be obtained at 10s. 6d. per Volume. Complete set of 19 vols. £6 13s. 6d. net. "Special Index" to Vols. III., IV., V., VI., VII., VIII., IX., X., XI., XII., XIII., XIV., XV., XVI., XVII., XVIII. and XIX., are sold separately, price 1/6 each. Single Back Numbers can be obtained at double the published price from 119, Westcombe Hill, Blackheath, S.E.

Subscribers are kindly requested to observe that subscriptions to *The Entomologist's Record*, &c., are payable in advance. The subscription (with or without the Special Index) is Seven Shillings, and must be sent to Mr. J. Herbert Tutt, 22, Francemary Road, Ladywell Road, Brockley, S.E. Cheques and Postal Orders should be made payable to J. W. TUTT.

ADVERTISEMENTS of Books and Insects for Sale will be inserted at a minimum charge of 2s. 6d. (for four lines). Longer Advertisements in proportion. A reduction made for a series. Particulars of Mr. J. Herbert Tutt, 22, Francemary Road, Ladywell Road, Brockley, S.E.

Subscribers who change their addresses must report the same to Mr. H. E. PAGE, "Bertrose," Gellatly Road, St. Catherine's Park, London, S.E., otherwise their magazines will probably be delayed, also to Mr. J. HERBERT TUTT, 22, Francemary Road, Ladywell Road, Brockley, S.E.

Articles for insertion and Exchanges should be sent to J. W. TUTT, Rayleigh Villa, Westcombe Hill, S.E., except notes relating to Coleoptera, which should be sent to Mr. H. DONISTHORPE, 58, Kensington Mansions, South Kensington, S.W., and of Orthoptera, to Mr. Burr, Eastry S.O., Kent.

Articles that require Illustration are inserted on condition that the author defrays the cost of the illustrations.

All Exchange Magazines must be forwarded to J. W. TUTT, Rayleigh Villa, Westcombe Hill, Blackheath, S.E.

Duplicates.—Complanella, Emberizæpennella, Coryli, Bremiella, Alnifoliella, Solitariella, Salicicolella, Spinolella, Lautella, Carpinicolella, Semidecandriella, Marginea, Pomifoliella, Cramerella, Maritima, Sylvela, Miscella, Stettinensis, Lantanella, Pfeifferella, For any specimens useful in my cabinets. Will send marked list.—J. A. Clark, 57, Weston Park, Crouch End, N.

Duplicates.—Barrettii (one very poor), Nigrocincta, Xerampelina, Fulvago, Saucia, Haworthii, Nigra, Umbratica, Gemina, Leucostigma, Literosa, Tritici, N-rubi, Umbrosa, Maura, Triplasia, Multistrigaria, Rupicaprarica, Galiata, Apiciaria, Ruberata, Obscuraria, Subsericeata, Virgularia, Exanthemaria and others. *Desiderata*.—Very numerous, especially Scotch insects.—S. Cassal, Brook Villa, Ballaugh, Isle of Man.

Duplicates.—Suspecta, Festiva,* Angularia,* Suffumata, Inornata, Brunnea,* Scolopacina, Dahlii, Glareosa, Multistrigaria, E. autumnaria,* Myrtilli, Aurantiaria, Viminalis* (black), Polyodon (black), Paleacea, Cæsiata,* Solidaginis, C-nigrum, Petasitis, Oxyacanthæ var. Capucina. *Desiderata*.—Numerous.—B. Morley, Wind Mill, Skelmanthorpe, Huddersfield.

Duplicates.—Carthami, Sebrus, Gordius, Mnemosyne, Cratægi, var. Bryonia, Simponia, Daphne, Cinxia, Didyma, Dictynna, Parthenie, Mæra, Hiera, Evias. All fully labelled. *Desiderata*.—Palæarctic butterflies, e.g., Spini, Acaciæ, Pruni, Eros, Cynthia, Arethusa and other Satyrids, Lappona, Stygne, etc.—A. S. Tetley, 22, Avenue Road, Scarborough.

Duplicates.—Grossulariata var. Varleyata. *Desiderata*.—Euphorbiæ, Livornica, Vespiiformis, Andreniformis, Illicifolia; Cænosa, Palustris ♀, Xerampelina var. Unicolor, Nebulosa var. Thompsoni, Satura, Ocellaris, Ni, Fraxini, Fuliginaria, Roboraria (black var.), Innotata, Stevensata, Salicalis, Unionalis, Semirufa, Abietella, Splendidella, Terebrella, Rubrotibiella, Tesseradactyla and other rarities and good varieties.—Geo. T. Porritt, Elm Lea, Dalton, Huddersfield.

Duplicates.—Favicolor (a few good). *Desiderata*.—Albipuncta, Conspicillaris, Strigosa, Nubeculosa and other good local species—J. Ovenden, Frindsbury, Rochester, Kent.

Duplicates.—Iris,* Andreniformis,* Exulis, Alpina, Rubiginea,* Nigrocincta, Humuli, extreme Shetland varieties, L. exigua,* Graphodactyla.* *Desiderata*.—Ni, Vitellina, Conformis, Emphyrea, Sphegiformis, Dominula (yellow var.), Grossulariata vars., Galii, and other scarce species and good varieties.—P. M. Bright, Fairfield, Wimborne Road, Bournemouth.

Duplicates.—Sibylla, W-album, Actæon, Paphia, Convolvuli, Bembeciformis, Exulans, Meliloti, Revayana, Senex, Complanata, Cribrum, Chrysorrhæa, Fascelina,* Hamula, Chaonia, Geminipuncta, Hispidus, Confua (fine Shetland vars.), Humuli (Shetland vars.), Neglecta, Piniperda, Leucogrypha, Leucophæa (few fair), Fimbria,* Herbita,* Absinthii,* Adusta, Melanopa, Advenaria, Fuscantaria,* Abietaria,* Consortaria, Trepidaria, Orbicularia,* Emutaria, Pictaria, Alternata,* Belgaria, Salicata, Alchemillata, Blandiata, Absinthiata,* Togata,* Dodoneata,* Pusillata, Immanata

(fine Shetland forms), *Albulata*, *Psitticata*, *Montanata* (Shetland vars.), *Dubitata*, *Undulata*, *Bilineata* (fine Shetland vars.), *Thuleana*, *Sylvestrana*,* *Literana*, *Colquhounana*, *Dalella*. *Desiderata*.—Numerous.—*P. M. Bright, Fairfield, Wimborne Road, Bournemouth.*

WANTED.—Correspondence with anyone interested in Natural History in British Colonies. I can assist in nearly every branch—Entomological, Botanical, etc.—*J. W. H. Harrison, 181, Abingdon Road, Middlesboro', England.*

WANTED.—Indian *Theclas*, *Chrysophanids*, and *Lycænids*. Offered—*Palæarctic* and *Nearctic* species.—*J. W. H. Harrison, 181, Abingdon Road, Middlesboro'.*

WANTED.—Good photographs or careful drawings of *Aberrations*, *Gynandromorphs*, etc., of any British "Blues," for reproduction in *The Natural History of the British Butterflies*. Also photos and good drawings of *Aberrations* and *Gynandromorphs* of other groups that may be used later as opportunity offers. [Specimens not necessarily British.] *J. W. Tutt, 119, Westcombe Hill, Blackheath.*

MEETINGS OF SOCIETIES.

Entomological Society of London.—11, Chandos Street, Cavendish Square, W., 8 p.m. Meetings—October 21st, November 4th, 18th, December 2nd.

The City of London Entomological and Natural History Society.—London Institution, Finsbury Circus, E.C.—The first and third Tuesdays in the month, at 7.30 p.m., except in July and August.

Toynbee Hall Natural History Society.—Held at Toynbee Hall, Commercial Street, E., Mondays, at 8 p.m.

The South London Entomological and Natural History Society, *Hibernia Chambers*, London Bridge.—The second and fourth Thursdays in each month, at 8 p.m.

North London Natural History Society, *The Amherst Club*, Amhurst Road, N.—Meetings. [No notices received.]

Lancashire and Cheshire Entomological Society.—Meetings at the Royal Institution, Liverpool, on the 3rd Monday in the month from October to April. Hon. Sec., *H. R. Sweeting, 6, The Elms, Dingle, Liverpool.*

A Quantity of **ENTOMOLOGICAL APPARATUS** is Offered in good condition at Half Price—carriage extra:—

STORE BOXES—14 (5/- size) at 2/6 each—one stained mahogany.

7 (4/- size) at 2/- each—one stained.

4 (2/6 size) at 1/3 each.

SETTING BOARDS—as new.

7 (3½ in.), 8 (3 in.), 9 (2½ in.), 2 (2¼ in.), 10 (2 in.), 10 (1¾ in.),

8 (1½ in.), 3 (1¼ in.), 3 (1 in.), 5 (¾ in.), 1 (½ in.).

SETTING CASE—deal, varnished, brass handles, 16 in. high, 13 in. wide, 13 in. deep.

1 Zinc Box (2/- size), 1 small Larva Tin and 1 large ditto.

Enquiries to be addressed—

Mr. H. E. PAGE, Bertrose, Gellatly Road, New Cross, S.E.

Notes on the *Zygænidæ*.

By **J. W. TUTT, F.E.S.**

PRICE ONE SHILLING AND SIXPENCE.

(Containing an account of the newly-discovered British species.)

Chapter I. *Zygaena exulans* and its varieties.

Chapter II. *Zygaena carniolica* and its varieties.

Chapter III. *Zygaena achilleae* and its varieties.

Chapter IV. *Zygaena transalpina* and its varieties.

Chapter V. *Zygaena medicaginis* and its varieties.

Chapter VI. *Zygaena oechsenheimeri*.

Postal Orders to **A. H., 41, Wisteria Road, Lewisham, S.E.**

Practical Hints for the Field Lepidopterist (Illustrated)

By J. W. TUTT, F.E.S.

PARTS I II & III

(Interleaved for Collector's own notes.)

Price 6s. each volume, net, or 17s. 6d. for the three parts.

Containing about 4000 Practical Hints of the form so well known.

Together with

General and Special Index to Parts I II & III.

(Containing references to nearly 1600 British species)

By H. J. TURNER, F.E.S.

Together with Chapters on

Preservation, Mounting, and Photographing of Eggs.

By F. NOAD CLARK AND A. E. TONGE, F.E.S.

Also detailed chapters on

"The Collection and Conservation of Lepidoptera," "Killing," "Pinning," "Entomological Pins," "Setting," "Labelling," "Holiday Collecting," "Collections," "Collecting," "The Egg and Egg Stage," "The Larva and Larval Stage," "The Pupa and Pupal Stage." Instructions on the technical description of "Eggs," "Larvæ," "Pupæ," etc.

The whole comprising the most important book on the subject ever offered to the field lepidopterist, and a complete encyclopædia of Field Lepidopterology.

Roughly, the number of species of lepidoptera in the whole British fauna amounts to about 2100 species. It was not until the three parts were carefully indexed by Mr. Turner that it was suspected how wide a field the "Hints" covered, and how comparatively few of the British species, other than the very commonest, received no "hint" as to their mode of capture in one or other of their stages. The long general index shows that the work is encyclopædic from the field lepidopterist's point of view; nothing so complete as the hints on sallowing, light, sugaring, egg-laying, larva-hunting (in all its forms), pupa-hunting, and the various phases of rearing lepidoptera—breeding-cages, treatment, food, etc.—having ever been attempted. In addition to these points, many chapters, simple enough for the beginner, and yet advanced enough to teach the expert something, have been added, with the intention of suggesting to the field lepidopterist how to use his observations and work, not only to his own advantage, but also to the advantage of entomological science, and the book can be recommended as being of first value to all field entomologists, whilst the chapters on the preservation, mounting, measurement, and photographing of eggs, will appeal to a very large class of entomologists.

DEAR SIR,—Please forward me a set of *Practical Hints*, Parts I, II, and III, for which I enclose Postal Order for **17s. 6d.**

Name.....

Address.....

.....

To Mr. J. HERBERT TUTT, 22, Francemary Road, Ladywell Road, Brockley, S.E.

SPLENDID ! THANKS !!

One does not hear this or a similar expression of glad feeling as often as one could wish, and its absence is frequently due to man's dilatoriness in exercising a proper care for his health. The habit of procrastination is strong in human nature. A slight indisposition—a feeling of being a bit “below par”—is given very little heed to, with the result that alarming symptoms often ensue. It is a truism that most sickness takes its rise in Indigestion, or a torpid state of the Liver and Bowels—conditions where

BEECHAM'S PILLS

may be depended upon with absolute confidence to effect a cure. Therefore, never permit the trouble to gain a hold upon your constitution—check it at the outset. Whether it be a case of Indigestion, Biliousness, Constipation, or an Anæmic and impure state of the blood, you should at once set about fortifying yourself by entering upon a course of BEECHAM'S PILLS. All sensations of depression and undue fatigue will disappear, your energies will speedily revive, you will regain all your lost vigour, and ere long you will join with tens of thousands in saying that, for “putting one right,” BEECHAM'S PILLS

DESERVE ALL PRAISE.

Prepared only by **THOMAS BEECHAM**, St. Helens, Lancs.

Sold everywhere in boxes, price 1/1½ (56 pills) & 2/9 (168 pills.)

Subscriptions for Vol. XX (7 shillings) should be sent to **J. Herbert Tutt, 22, Francemary Road, Ladywell Road, Brockley, S.E.** Will subscribers please oblige? [This subscription includes all numbers published from January 15th to December 15th, 1908.]

Non-receipt or errors in the sending of Subscribers' magazines should be notified to **Mr. H. E. Page, “Bertrose,” Gellatly Road, Hatcham, S.E.**

NOTICE.

The **Back Volumes** (I-XIX) of *The Entomologist's Record*, &c., can be obtained at 10s. 6d. per Volume. Complete set of 19 vols. £6 13s. 6d. net. “**Special Index**” to Vols. III., IV., V., VI., VII., VIII., IX., X., XI., XII., XIII., XIV., XV., XVI., XVII., XVIII. and XIX., are sold separately, price 1/6 each. **Single Back Numbers** can be obtained at double the published price from **119, Westcombe Hill, Blackheath, S.E.**

Subscribers are kindly requested to observe that subscriptions to *The Entomologist's Record*, &c., are payable in advance. The subscription (with or without the Special Index) is Seven Shillings, and must be sent to **Mr. J. Herbert Tutt, 22, Francemary Road, Ladywell Road, Brockley, S.E.** Cheques and Postal Orders should be made payable to **J. W. TUTT**.

ADVERTISEMENTS of **Books and Insects for Sale** will be inserted at a minimum charge of 2s. 6d. (for four lines). Longer Advertisements in proportion. A reduction made for a series. Particulars of **Mr. J. Herbert Tutt, 22, Francemary Road, Ladywell Road, Brockley, S.E.**

Subscribers who change their addresses must report the same to **Mr. H. E. PAGE, “Bertrose,” Gellatly Road, St. Catherine's Park, London, S.E.**, otherwise their magazines will probably be delayed, also to **Mr. J. HERBERT TUTT, 22, Francemary Road, Ladywell Road, Brockley, S.E.**

Articles for insertion and Exchanges should be sent to **J. W. TUTT, Rayleigh Villa, Westcombe Hill, S.E.**, except notes relating to Coleoptera, which should be sent to **Mr. H. DONISTHORPE, 58, Kensington Mansions, South Kensington, S.W.**, and of Orthoptera, to **Mr. Burr, Eastry S.O., Kent.**

Articles that require Illustration are inserted on condition that the author defrays the cost of the illustrations.

All **Exchange Magazines** must be forwarded to **J. W. TUTT, Rayleigh Villa, Westcombe Hill, Blackheath, S.E.**

Duplicates.—*Sibylla*,* *Betulæ*,* *Artaxerxes*, *Fuciformis*, *Humuli* (fine Shetland ones), *Exulans*, *Meliloti*, *Senex*, *Mesomella*, *Complana*, *Cribbrum*, *Bembeciformis*, *Templi*,* *Confua* (fine Shetland forms), *Impluviata*, *Inmanata* (Shetland), *Adusta*, *Belgiaria* ♂, *Falicata*, *Fascelina*,* *Fimbria*,* *Herbida**, *Absinthii**, *Hispidus*, *Monacha*, *Fuscantaria*,* *Satyrata*, *Absinthiata*,* *Curzoni*, *Albicellata*,* *Melanopa*, *Aprilina*, *Revayana*, *Abietaria*,* *Pudorina*, *Sylvestrana*, *Graphodactyla*, *Dalella*.—*Percy M. Bright, Fairfield, Wimborne Road, Bournemouth.*

Duplicates.—Pupæ Venosata (Shetland), Consersa (Shetland), Albulata (Shetland), Alternata, Asellus, Orbicularia, Gothicina, Consonaria, Batis, Advenaria, Piniaria, Consortaria.—Percy M. Bright, Fairfield, Wimborne Road, Bournemouth.

EXCHANGE.—Vitellina (8), Exigua (3), and many others. What offers? Lists exchanged.—W. R. Goodale, Oatlands, Putney.

WANTED.—Correspondence with anyone interested in Natural History in British Colonies. I can assist in nearly every branch—Entomological, Botanical, etc.—J. W. H. Harrison, 181, Abingdon Road, Middlesboro', England.

WANTED.—Indian Theclæ, Chrysophanids, and Lycænids. Offered—Palæarctic and Nearctic species.—J. W. H. Harrison, 181, Abingdon Road, Middlesboro'.

WANTED.—Good photographs or careful drawings of Aberrations, Gynandromorphs, etc., of any British "Blues," for reproduction in *The Natural History of the British Butterflies*. Also photos and good drawings of Aberrations and Gynandromorphs of other groups that may be used later as opportunity offers. [Specimens not necessarily British.] J. W. Tutt, 119, Westcombe Hill, Blackheath.

MEETINGS OF SOCIETIES.

Entomological Society of London.—11, Chandos Street, Cavendish Square, W., 8 p.m. Meetings—November 18th, December 2nd, January 20th (Annual Meeting).

The City of London Entomological and Natural History Society.—London Institution, Finsbury Circus, E.C.—The first and third Tuesdays in the month, at 7.30 p.m., except in July and August.

Toynbee Hall Natural History Society.—Held at Toynbee Hall, Commercial Street, E., Mondays, at 8 p.m. Meetings—December 7th. January 11th, 1909, President's Address. November 28th, Field meeting and visit to the Essex Museum of Natural History; meet at the Museum at 3.15 p.m. (Essex Museum of Natural History, Romford Road, Stratford).

The South London Entomological and Natural History Society, Hibernia Chambers, London Bridge.—The second and fourth Thursdays in each month, at 8 p.m. November 26th, December 10th, January 14th, January 28th (Annual Meeting at 7 p.m.).

North London Natural History Society, The Amherst Club, Amhurst Road, N.—Meetings. [No notices received.]

Lancashire and Cheshire Entomological Society.—Meetings at the Royal Institution, Liverpool, on the 3rd Monday in the month from October to April. Hon. Sec., H. R. Sweeting, 2, Halkyn Avenue, Sefton Park, Liverpool.

The South-Eastern Union of Scientific Societies.—Autumnal Meeting, November 28th. To Tring—Euston 1 p.m. and 1.20 p.m.; Willesden, 1.32 p.m.; Broad Street, 1.20 p.m. Tickets—Euston, 5s. 9d.; Willesden, 5s. 3d., from Mr. H. Norman Gray, 334, Commercial Road, London, E.

NOTICE TO LIBRARIANS AND OTHERS.

The following copies of these well-known works are still to be disposed of.

BRITISH NOCTUÆ AND THEIR VARIETIES, Vols.I.-IV.

A complete set (good as new) at the reduced price of **22/-**.

Also a set of

THE NATURAL HISTORY OF THE BRITISH LEPIDOPTERA,

Vols. I.-V. and IX.-X. for **£5** (£2 less than published price), or

Vols. I.-V. for **£3 3s.** (£1 17s. less than published price).

Address—A. H., 41, Wisteria Road, Lewisham, S.E.

Notes on the Zygænidæ.

By **J. W. TUTT, F.E.S.**

PRICE ONE SHILLING AND SIXPENCE.

(Containing an account of the newly-discovered British species.)

- Chapter I. *Zygaena exulans* and its varieties.
- Chapter II. *Zygaena carniolica* and its varieties.
- Chapter III. *Zygaena achilleæ* and its varieties.
- Chapter IV. *Zygaena transalpina* and its varieties.
- Chapter V. *Zygaena medicaginis* and its varieties.
- Chapter VI. *Zygaena ochsenheimeri*.

Postal Orders to A. H., 41, Wisteria Road, Lewisham, S.E.

Practical Hints for the Field Lepidopterist (Illustrated)

By J. W. TUTT, F.E.S.

PARTS I II & III

(Interleaved for Collector's own notes.)

Price 6s. each volume, net, or 17s. 6d. for the three parts.

Containing about 4000 Practical Hints of the form so well known.

Together with

General and Special Index to Parts I II & III.

(Containing references to nearly 1600 British species)

By H. J. TURNER, F.E.S.

Together with Chapters on

Preservation, Mounting, and Photographing of Eggs.

By F. NOAD CLARK AND A. E. TONGE, F.E.S.

Also detailed chapters on

"The Collection and Conservation of Lepidoptera," "Killing," "Pinning," "Entomological Pins," "Setting," "Labelling," "Holiday Collecting," "Collections," "Collecting," "The Egg and Egg Stage," "The Larva and Larval Stage," "The Pupa and Pupal Stage." Instructions on the technical description of "Eggs," "Larvæ," "Pupæ," etc.

The whole comprising the most important book on the subject ever offered to the field lepidopterist, and a complete encyclopædia of Field Lepidopterology.

Roughly, the number of species of lepidoptera in the whole British fauna amounts to about 2100 species. It was not until the three parts were carefully indexed by Mr. Turner that it was suspected how wide a field the "Hints" covered, and how comparatively few of the British species, other than the very commonest, received no "hint" as to their mode of capture in one or other of their stages. The long general index shows that the work is encyclopædic from the field lepidopterist's point of view; nothing so complete as the hints on sallowing, light, sugaring, egg-laying, larva-hunting (in all its forms), pupa-hunting, and the various phases of rearing lepidoptera—breeding-cages, treatment, food, etc.—having ever been attempted. In addition to these points, many chapters, simple enough for the beginner, and yet advanced enough to teach the expert something, have been added, with the intention of suggesting to the field lepidopterist how to use his observations and work, not only to his own advantage, but also to the advantage of entomological science, and the book can be recommended as being of first value to all field entomologists, whilst the chapters on the preservation, mounting, measurement, and photographing of eggs, will appeal to a very large class of entomologists.

DEAR SIR,—Please forward me a set of *Practical Hints*, Parts I, II, and III, for which I enclose Postal Order for **17s. 6d.**

Name.....

Address.....

.....

To Mr. J. HERBERT TUTT, 22, Francemary Road, Ladywell Road, Brockley, S.E.

The Entomologist's Library.

Books written by J. W. TUTT, F.E.S.

A Natural History of the British Lepidoptera, their world-wide variation and geographical distribution (*illustrated*).

(A text-book for Students and Collectors.)

Vols. I, II, III, IV, V, VIII and IX, Price £1 each volume, net. Demy 8vo., thick, strongly bound in cloth. Complete set of 7 vols., £6 net. The most concise and thorough work on Lepidoptera ever offered to the entomological public.

The British Noctuæ and their Varieties. Complete in 4 volumes. 28s. per set net. Demy 8vo., strongly bound in cloth. Full account of the typical and all known described forms, with original descriptions.

Melanism and Melanochroism in British Lepidoptera. Demy 8vo., bound in cloth. Price 5s. A full account of all the facts known bearing on the subject, and a closely reasoned explanation of probable causes.

100 Practical Hints on the British Eupitheciids. Price 1s. A series of hints on the method of finding and rearing eggs, larvæ, pupæ and imagines of the "pugs."

Rambles in Alpine Valleys. Crown 8vo. Bound in Cloth. With map and photographs. Price 3s. 6d. net. A graphic account of the rambles of a naturalist on the Italian side of Mont Blanc.

Random Recollections of Woodland, Fen, and Hill. Crown 8vo. Bound in Cloth. Price 3s. net. A detailed account of the fauna and flora of some well-known British natural history localities—Wicken, Deal, Chattenden, the Medway marshes, Freshwater, &c.

Woodside, Burnside, Hillside, and Marsh. Crown 8vo. Bound in Cloth. 242 pp. and 103 woodcuts and full-page illustrations. Price 2s. 6d. net. Descriptive account of well-known natural history localities (botanical, entomological, geological, ornithological), including Cobham, Cliffe, Cuxton, the Western Highlands, &c.

Stray Notes on the Noctuæ. Price 1s. net. An account of the classification of the Noctuid moths, etc.

Notes on the Zygaenidæ. Price 1s. An account of the habits, etc., of several species of the Alpine Burnet moths.

Some considerations of Natural Genera and incidental reference to the nature of Species. Price 1s. 6d. net. A detailed consideration of the nature of genera and species.

Some considerations of the Nature and Origin of Species. Price 1s. 6d. net. A detailed consideration of the causes that have led to specific forms and their isolation.

Some results of recent Experiments in hybridising *Tephrosia bistortata* and *T. crepuscularia*. Price 2s. net. Full account of experiments conducted by Dr. Riding and Mr. Bacot in hybridising these allied species.

The Drinking Habits of Butterflies and Moths. Price 1s. 6d. An interesting essay on the habit as observed in many parts of the world and its possible meanings.

The Nature of Metamorphosis. Price 1s. 6d. net. An essay on the nature of the various forms and degrees of metamorphosis in different orders of insects.

The Scientific Aspects of Entomology. Parts I. and II. 1s. each part, net. Critical review of the various scientific uses to which the work of entomologists may be put.

Catalogue of the Palæarctic Psychides. Price 6d. net.

Catalogue of the Palæarctic Lachneides. Price 6d. net.

Catalogue of the Palæarctic Dimorphides, Bombycides, Brahmæides, and Attacides. Price 6d. net. These give all the family, tribal, generic, and specific names, as well as those of all named varieties and aberrations most useful for labelling.

Reissue of Hubner's "Tentamen." (Only two copies of the original known.) Price 6d. net. A reprint of this rare pamphlet; of the greatest use to all lepidopterists interested in synonymy.

Postal Orders to be addressed to J. HERBERT TUTT, 22, Francemary Road, Ladywell Road, Brockley, S.E.

WATKINS & DONCASTER,

Naturalists and Manufacturers of Entomological Apparatus and Cabinets

Plain Ring Nets, wire or cane, including Stick, 1/3, 2/-, 2/6, 3/-. Folding Nets, 3/6, 4/-, 4/6. Umbrella Nets (self-acting), 7/-. Pocket Boxes (deal), 6d., 9d., 1/-, 1/6. Zinc Collecting Boxes, 9d., 1/-, 1/6, 2/-. Nested Chip Boxes, 7d. per four dozen, 1 gross, 1/6. Entomological Pins, 1/6 per ounce. Pocket Lanterns, 2/6 to 8/-. Sugaring Tin, with brush, 1/6, 2/-. Sugaring Mixture, ready for use, 1/9 per tin. Store-Boxes, with camphor cells, 2/6, 4/-, 5/-, 6/-. Setting-Boards, flat or oval, 1in., 6d.; 1½in., 8d.; 2in., 10d.; 2½in., 1/-; 3½in., 1/4; 4in., 1/6; 5in., 1/10; Complete Set of fourteen Boards, 10/6. Setting Houses, 9/6, 11/6; corked back, 14/-. Zinc Larva Boxes, 9d., 1/-, 1/6. Breeding Cage, 2/6, 4/-, 5/-, 7/6. Coleopterist's Collecting Bottle, with tube, 1/6, 1/8. Botanical Cases, japanned double tin, 1/6 to 4/6. Botanical Paper, 1/1, 1/4, 1/9, 2/2 per quire. Insect Glazed Cases, 2/6 to 11/-. Cement for replacing Antennæ 4d. per bottle. Steel Forceps, 1/6, 2/-, 2/6 per pair. Cabinet Cork, 7 by 3½, best quality 1/6 per dozen sheets. Brass Chloroform Bottle, 2/6. Insect Lens, 1/- to 8/-. Glass-top and Glass-bottomed Boxes, from 1/- per dozen. Zinc Killing Box, 9d. to 1/-. Pupa Digger, in leather sheath, 1/9. Taxidermist's Companion, containing most necessary implements for skinning, 10/6. Scalpels, 1/3; Scissors, 2/- per pair; Eggdrills, 2d., 3d., 9d.; Blowpipes, 4d.; Artificial Eyes for Birds and Animals. Label-lists of British Butterflies, 2d.; ditto of Birds' Eggs, 2d., 3d., 6d.; ditto of Land and Fresh-water Shells, 2d. Useful Books on Insects, Eggs, etc.

THE WAND TELESCOPE NET (An innovation in Butterfly Nets).

We beg to call your attention to our new Telescopic Handle for butterfly nets. It is made entirely in brass, and is light and strong, and, moreover, it can be shut up to carry in small compass. A very compact pattern, effecting great saving in weight and bulk.

Prices—2 joints, 8/6; 3 joints, 9/6; 4 joints, 10/6.

Complete with cane folding ring and bag. We shall be pleased to send on application.

SHOW ROOM FOR CABINETS

Of every description of INSECTS, BIRDS' EGGS, COINS, MICROSCOPICAL OBJECTS, FOSSILS, &c.

Catalogue (100 pages) sent on application, post free.

LARGE STOCK OF INSECTS AND BIRDS' EGGS (British, European, and Exotic).

Birds, Mammals, etc., Preserved and Mounted by First-class Workmen.

Only address—**36, STRAND, LONDON, W.C. (5 doors from Charing Cross).**

OVA, LARVÆ, AND PUPÆ.

The Largest Breeder of Lepidoptera in the British Isles is

H. W. HEAD, Entomologist,
SCARBOROUGH.

Full List of Ova, Larvæ, and Pupæ, also Lepidoptera, Apparatus, Cabinets, etc., sent on application.

Many Rare British Species and Good Varieties for Sale.

Lantern Slides in Natural Colours.

LEPIDOPTERA & LARVÆ A SPECIALITY.

Photographed from life and true to Nature in every detail.

SLIDES OF BIRDS, WILD FLOWERS, &c.,

By same Colour Process.

LANTERN SLIDES MADE TO ORDER FROM ANY SPECIMEN OR COLOURED DRAWING.

**PHOTOS IN COLOUR OF LARVÆ, LIFE SIZE, ON IVORINE
TABLETS TO PIN IN THE CABINET.**

For List apply to—

CHARLES D. HEAD, 2, Mount Vernon, Dollymount, DUBLIN.

THE THIRD VOLUME
OF
A NATURAL HISTORY
OF THE
BRITISH BUTTERFLIES,
THEIR WORLD-WIDE VARIATION AND GEOGRAPHICAL DISTRIBUTION.

By J. W. TUTT, F.E.S.,

The **third volume** of the above standard work, *fully and profusely illustrated*, will be published in **20 parts**, at **1s.** per part. These parts will contain a *monographic revision of the British "blue" butterflies*, confessedly the most difficult group of butterflies to deal with biologically, represented in the British Isles. For this work *life-histories* of each British species have been worked out at length, and *photographs of the different stages* of almost every species *made from life*.

Since the completion of the last volume, it has been necessary to revise the species in the group to which *Everes argiades* belongs; this has now been done, if not altogether so completely as one could wish, sufficiently for our purpose, and **Part I** is now in the printer's hands, and we trust will be forwarded to subscribers shortly (in the course of a few days at most). The literature relating to some of the species is enormous, and we are fortunate in having persuaded the *Rev. G. Wheeler, M.A.*, author of the well-known "Butterflies of Switzerland," to aid us in the synonymic and more literary parts of our work. *All our former collaborators*, in addition, are helping us with the present volume.

The expense of *illustrating* this volume in detail will be so heavy, that we wish to secure as large a subscription list as possible. We are sure that those who know the work consider the illustrations a great improvement, but a larger subscription list is necessary if we are to expand as largely as is possible in this direction.

Subscribers for the 20 parts (in the last volume these extended to 25 parts at the same subscription price) is fixed at **17s. 6d.**, which must be paid direct to *J. Herbert Tutt*. Copies bought through the booksellers must be paid for at their face value per number. *To ensure delivery as soon as published, subscriptions should be sent direct, and the following (or a similar) covering note forwarded therewith:—*

Please enter my name as a subscriber for the new series of 20 parts of *A Natural History of the British Butterflies*, for which I enclose postal order for 17s. 6d.

Name.....

Address.....

Date.....

J. HERBERT TUTT, 119, Westcombe Hill, Blackeath, S.E.

Monograph of the British Pterophorina.

By **J. W. TUTT, F.E.S.**

(Demy 8vo., 161 pp., bound in Cloth.)

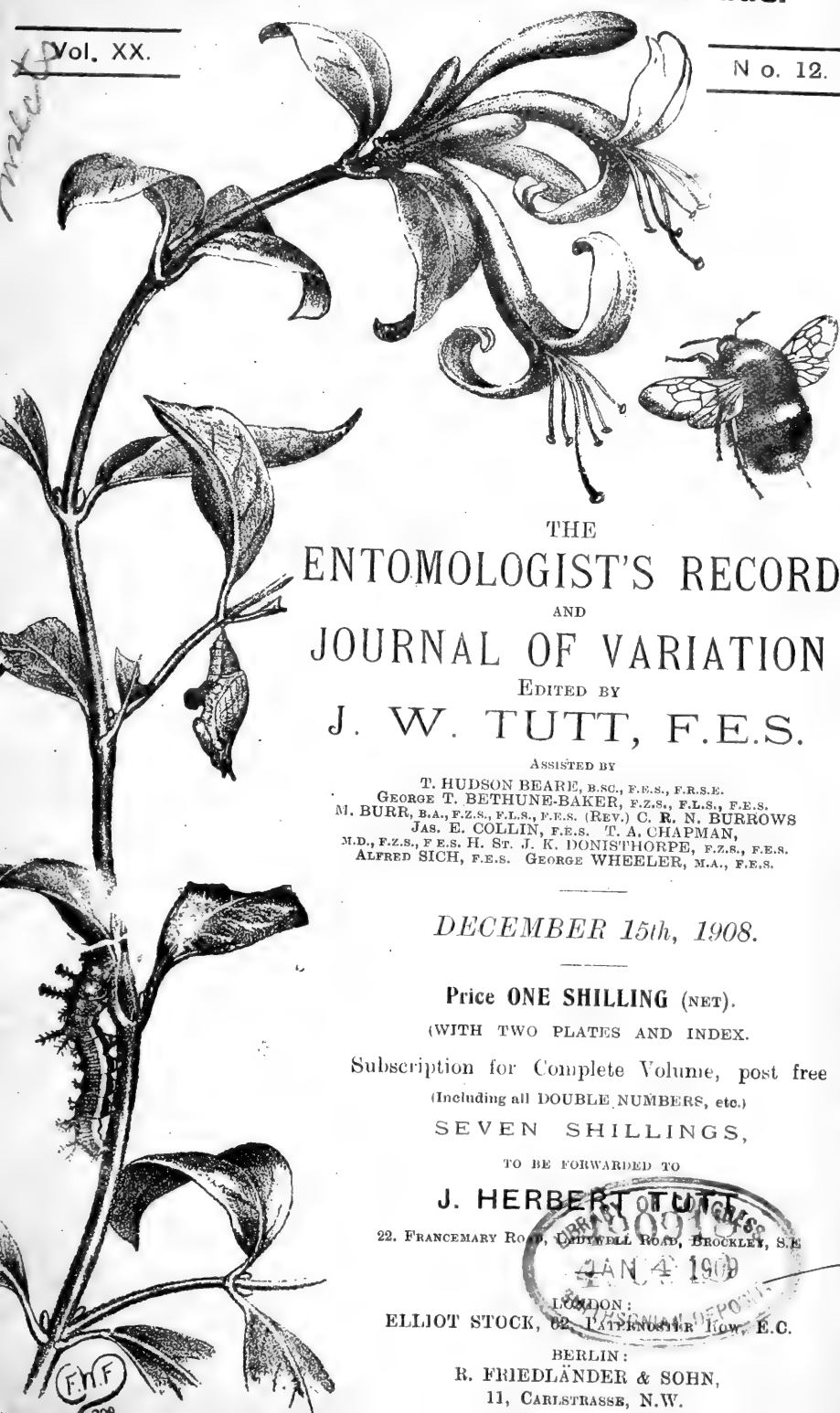
Price 5/- net.

This book contains an introductory chapter on "Collecting," "Killing" and "Setting" the Pterophorina, a table giving details of each species—Times of appearance of larva, of pupa, and of imago, food-plants, mode of pupation, and a complete account (so far as is known) of every British species, under the headings of "Synonymy," "Imago," "Variation," "Ovum," "Larva," "Food-plants," "Pupa," "Habitat," and "Distribution." It is much the most complete and trustworthy account of this interesting group of Lepidoptera that has ever been published.

Subscriptions for Vol. XXI are now due.

Vol. XX.

No. 12.



THE
ENTOMOLOGIST'S RECORD
AND
JOURNAL OF VARIATION
EDITED BY
J. W. TUTT, F.E.S.

ASSISTED BY

T. HUDSON BEARE, B.SC., F.E.S., F.R.S.E.
GEORGE T. BETHUNE-BAKER, F.Z.S., F.L.S., F.E.S.
M. BURR, B.A., F.Z.S., F.L.S., F.E.S. (REV.) C. R. N. BURROWS
JAS. E. COLLIN, F.E.S. T. A. CHAPMAN,
M.D., F.Z.S., F.E.S. H. ST. J. K. DONISTHORPE, F.Z.S., F.E.S.
ALFRED SICH, F.E.S. GEORGE WHEELER, M.A., F.E.S.

DECEMBER 15th, 1908.

Price ONE SHILLING (NET).

(WITH TWO PLATES AND INDEX.

Subscription for Complete Volume, post free
(Including all DOUBLE NUMBERS, etc.)

SEVEN SHILLINGS,

TO BE FORWARDED TO

J. HERBERT TUTT

22, FRANCIS ROAD, CHATELAIN ROAD, BROCKLEY, S.E.

LONDON:
ELLIOT STOCK, 62, PATERNOSTER ROW, E.C.

BERLIN:
R. FRIEDLÄNDER & SOHN,
11, CARLSTRASSE, N.W.

Immediate Annuities

With Return of Purchase Money

For Particulars write . . .

GRESHAM LIFE ASSURANCE SOCIETY, LTD.

ST. MILDRED'S HOUSE, LONDON, E.C.

ASSETS EXCEED - £9,800,000.

JAMES H. SCOTT, *General Manager and Secretary.*

D. F. TAYLER & Co., Ltd.,
Entomological Pin Manufacturers,

SMALL HEADS AND PERFECT POINTS. WHITE, BLACK, AND GILT.

BIRMINGHAM and LONDON.

Can be obtained from Dealers throughout the World.

NEW FOREST BUTTERFLIES & MOTHS

Ova, Larvæ, Pupæ, and (bred) Imagines supplied to order by

G. TATE and SON,

Entomologists, Lyndhurst, New Forest.

Established 1870.

Instructions given in Practical Entomology. Correspondence invited.

LABELS ! LABELS !! LABELS !!!

It is very essential that every specimen, to be authentic, should bear a minute label, giving locality, date of capture, and name of captor.

3000	<div style="display: flex; align-items: center;"> <div style="font-size: 3em; margin-right: 10px;">{</div> <div> <p>To comprise equal numbers of not more than ten localities.</p> <p>Larger quantities <i>pro rata</i>. Orders executed in same order as received. Remittance in full must accompany each order.</p> </div> </div>	5/-
	<div style="display: flex; justify-content: space-around;"> <div>Rannoch 16. vi. 97</div> <div>New Forest 4. ix. 97</div> <div>Shetland 5. v. 97</div> </div>	

ADDRESS.—“Requisites,” Coombe Lodge, Mycenæ Road,
 Westcombe Park, S.E.

A LIST of the COLEOPTERA of LANCASHIRE & CHESHIRE

By W. E. SHARP, F.E.S.

Copies of this recently published list, which has been very favourably received by Coleopterists, may be obtained from—

H. R. SWEETING,

2, Halkyn Avenue, Sefton Park, Liverpool.

Price, Cloth Bound, Five Shillings; Paper Covers, Four Shillings.

SPLENDID ! THANKS ! !

One does not hear this or a similar expression of glad feeling as often as one could wish, and its absence is frequently due to man's dilatoriness in exercising a proper care for his health. The habit of procrastination is strong in human nature. A slight indisposition—a feeling of being a bit “below par”—is given very little heed to, with the result that alarming symptoms often ensue. It is a truism that most sickness takes its rise in Indigestion, or a torpid state of the Liver and Bowels—conditions where

BEECHAM'S PILLS

may be depended upon with absolute confidence to effect a cure. Therefore, never permit the trouble to gain a hold upon your constitution—check it at the outset. Whether it be a case of Indigestion, Biliousness, Constipation, or an Anæmic and impure state of the blood, you should at once set about fortifying yourself by entering upon a course of BEECHAM'S PILLS. All sensations of depression and undue fatigue will disappear, your energies will speedily revive, you will regain all your lost vigour, and ere long you will join with tens of thousands in saying that, for “putting one right,” BEECHAM'S PILLS

DESERVE ALL PRAISE.

Prepared only by **THOMAS BEECHAM**, St. Helens, Lancs.

Sold everywhere in boxes, price 1/1½ (56 pills) & 2/9 (168 pills.)

Subscriptions for Vol. XXI (7 shillings) should be sent to **J. Herbert Tutt, 22, Francemary Road, Ladywell Road, Brockley, S.E.** Will subscribers please oblige? [This subscription includes all numbers published from January 15th to December 15th, 1909.]

Non-receipt or errors in the sending of Subscribers' magazines should be notified to **Mr. H. E. Page, “Bertrose,” Gellatly Road, Hatcham, S.E.**

TEMPORARY NOTICE.

The **Back Volumes** (I-XX) of *The Entomologist's Record, &c.*, can be obtained at 6s. per Volume. Complete set of 20 vols. £4 net. “**Special Index**” to Vols. III., IV., V., VI., VII., VIII., IX., X., XI., XII., XIII., XIV., XV., XVI., XVII., XVIII., XIX. and XX., are sold separately, price 1/6 each. **Single Back Numbers** can be obtained at the published price (plus postage) from **119, Westcombe Hill, Blackheath, S.E.**

Subscribers are kindly requested to observe that subscriptions to *The Entomologist's Record, &c.*, are payable in advance. The subscription (with or without the **Special Index**) is **Seven Shillings, and must be sent to Mr. J. Herbert Tutt, 22, Francemary Road, Ladywell Road, Brockley, S.E.** Cheques and Postal Orders should be made payable to **J. W. Tutt**.

ADVERTISEMENTS of **Books and Insects for Sale** will be inserted at a minimum charge of 2s. 6d. (for four lines). Longer Advertisements in proportion. A reduction made for a series. Particulars of **Mr. J. Herbert Tutt, 22, Francemary Road, Ladywell Road, Brockley, S.E.**

Subscribers who **change their addresses** must report the same to **Mr. H. E. Page, “Bertrose,” Gellatly Road, St. Catherine's Park, London, S.E.**, otherwise their magazines will probably be delayed, also to **Mr. J. HERBERT TUTT, 22, Francemary Road, Ladywell Road, Brockley, S.E.**

Articles for insertion and Exchanges should be sent to **J. W. TUTT, Rayleigh Villa, Westcombe Hill, S.E.**, except notes relating to Coleoptera, which should be sent to **Mr. H. DONISTHORPE, 58, Kensington Mansions, South Kensington, S.W.**, and of Orthoptera, to **Mr. Burr, Easry S.O., Kent.**

Articles that require Illustration are inserted on condition that the author defrays the cost of the illustrations.

All **Exchange Magazines** must be forwarded to **J. W. TUTT, Rayleigh Villa, Westcombe Hill, Blackheath, S.E.**

Duplicates.—Vitellina (few), Exigua (two), Hyale, Artemis, Cinxia, Quercus, W-album, Artaxerxes, Adonis, Corydon, Alsus, Arion, Convolvuli, Porcellus, Mesomella, Aureola, Caniola, Deplana, Hera, Unguicula, Anachoreta, Reclusa, Palpina, Putrescens, Hepatica, Rapæ (two), Carpophaga, Cucubali, Capsincola, Consersa, Serena, Peltigera

(one), Asteris (four), and many others. *Desiderata*.—Many local insects. Lists exchanged.—*W. R. Goodale, Oatlands, Paignton*.

WANTED.—Correspondence with anyone interested in Natural History in British Colonies. I can assist in nearly every branch—Entomological, Botanical, etc.—*J. W. H. Harrison, 181, Abingdon Road, Middlesboro', England*.

WANTED.—Indian Theclas, Chrysophanids, and Lycænids. Offered—Palæarctic and Nearctic species.—*J. W. H. Harrison, 181, Abingdon Road, Middlesboro'*.

WANTED.—Good photographs or careful drawings of Aberrations, Gynandromorphs, etc., of any British "Blues," for reproduction in *The Natural History of the British Butterflies*. Also photos and good drawings of Aberrations and Gynandromorphs of other groups that may be used later as opportunity offers. [Specimens not necessarily British.] *J. W. Tutt, 119, Westcombe Hill, Blackheath*.

MEETINGS OF SOCIETIES.

Entomological Society of London.—11, Chandos Street, Cavendish Square, W., 8 p.m. Meetings—January 20th (Annual Meeting).

The City of London Entomological and Natural History Society.—London Institution, Finsbury Circus, E.C.—The first and third Tuesdays in the month, at 7.30 p.m., except in July and August.

Toynbee Hall Natural History Society.—Held at Toynbee Hall, Commercial Street, E., Mondays, at 8 p.m. Meetings—January 11th, 1909, President's Address.

The South London Entomological and Natural History Society, Hibernia Chambers, London Bridge.—The second and fourth Thursdays in each month, at 8 p.m. January 14th, W. Bateson, F.R.S., "Recent Experiments in Mendelism; January 28th (Annual Meeting at 7 p.m.).

North London Natural History Society, The Amherst Club, Amhurst Road, N.—Meetings. [No notices received.]

Lancashire and Cheshire Entomological Society.—Meetings at the Royal Institution, Liverpool, on the 3rd Monday in the month from October to April. Hon. Sec., H. R. Sweeting, 2, Halkyn Avenue, Sefton Park, Liverpool.

Notes on the Zygaenidæ.

By **J. W. TUTT, F.E.S.**

PRICE ONE SHILLING AND SIXPENCE.

(Containing an account of the newly-discovered British species.)

- Chapter I. *Zygaena exulans* and its varieties.
- Chapter II. *Zygaena carniolica* and its varieties.
- Chapter III. *Zygaena achilleae* and its varieties.
- Chapter IV. *Zygaena transalpina* and its varieties.
- Chapter V. *Zygaena medicaginis* and its varieties.
- Chapter VI. *Zygaena ochsenheimeri*.

Postal Orders to **A. H., 41, Wisteria Road, Lewisham, S.E.**

The Migration and Dispersal of Insects.

By **J. W. TUTT, F.E.S.**

Demy 8vo., 132 pp. Price Five Shillings net.

This book, the only one published on this interesting subject, is of first importance to all students of the geographical distribution of animals, and contains the following chapters:—

1. General Considerations. 2. Coccids and Aphides. 3. Orthoptera. 4. Odonata. 5. Lepidoptera. 6. Coleoptera. 7. Diptera. 8. Social Insects—Hymenoptera, Termites. 9. Final considerations.

Only a small number of copies have been printed. It is trusted that all entomologists will, besides supporting the book themselves, recommend it to any libraries in which they are interested or with which they are connected.

J. HERBERT TUTT, 22, Francemary Road, Ladywell Road, Brockley, S.E.

Practical Hints for the Field Lepidopterist (Illustrated)

By J. W. TUTT, F.E.S.

PARTS I II & III

(Interleaved for Collector's own notes.)

Price 6s. each volume, net, or 17s. 6d. for the three parts.

Containing about 4000 Practical Hints of the form so well known.

Together with

General and Special Index to Parts I II & III.

(Containing references to nearly 1600 British species)

By H. J. TURNER, F.E.S.

Together with Chapters on

Preservation, Mounting, and Photographing of Eggs.

By F. NOAD CLARK AND A. E. TONGE, F.E.S.

Also detailed chapters on

"The Collection and Conservation of Lepidoptera," "Killing," "Pinning," "Entomological Pins," "Setting," "Labelling," "Holiday Collecting," "Collections," "Collecting," "The Egg and Egg Stage," "The Larva and Larval Stage," "The Pupa and Pupal Stage." Instructions on the technical description of "Eggs," "Larvæ," "Pupæ," etc.

The whole comprising the most important book on the subject ever offered to the field lepidopterist, and a complete encyclopædia of Field Lepidopterology.

Roughly, the number of species of lepidoptera in the whole British fauna amounts to about 2100 species. It was not until the three parts were carefully indexed by Mr. Turner that it was suspected how wide a field the "Hints" covered, and how comparatively few of the British species, other than the very commonest, received no "hint" as to their mode of capture in one or other of their stages. The long general index shows that the work is encyclopædic from the field lepidopterist's point of view; nothing so complete as the hints on sallowing, light, sugaring, egg-laying, larva-hunting (in all its forms), pupa-hunting, and the various phases of rearing lepidoptera—breeding-cages, treatment, food, etc.—having ever been attempted. In addition to these points, many chapters, simple enough for the beginner, and yet advanced enough to teach the expert something, have been added, with the intention of suggesting to the field lepidopterist how to use his observations and work, not only to his own advantage, but also to the advantage of entomological science, and the book can be recommended as being of first value to all field entomologists, whilst the chapters on the preservation, mounting, measurement, and photographing of eggs, will appeal to a very large class of entomologists.

DEAR SIR,—Please forward me a set of *Practical Hints*, Parts I, II, and III, for which I enclose Postal Order for **17s. 6d.**

Name.....

Address.....

.....

To Mr. J. HERBERT TUTT, 22, Francemary Road, Ladywell Road, Brockley, S.E.

The Entomologist's Library.

Books written by J. W. TUTT, F.E.S.

A Natural History of the British Lepidoptera, their world-wide variation and geographical distribution (*illustrated*).

(A text-book for Students and Collectors.)

Vols. I, II, III, IV, V, VIII and IX, Price £1 each volume, net. Demy 8vo., thick, strongly bound in cloth. Complete set of 7 vols., £5 5s. net.

The most concise and thorough work on Lepidoptera ever offered to the entomological public.

The British Noctuæ and their Varieties. Complete in 4 volumes. 28s. per set net. Demy 8vo., strongly bound in cloth. Full account of the typical and all known described forms, with original descriptions.

Melanism and Melanochroism in British Lepidoptera. Demy 8vo., bound in cloth. Price 5s. A full account of all the facts known bearing on the subject, and a closely reasoned explanation of probable causes.

100 Practical Hints on the British Eupitheciids. Price 1s. A series of hints on the method of finding and rearing eggs, larvæ, pupæ and imagines of the "pugs."

Rambles in Alpine Valleys. Crown 8vo. Bound in Cloth. With map and photographs. Price 3s. 6d. net. A graphic account of the rambles of a naturalist on the Italian side of Mont Blanc.

Random Recollections of Woodland, Fen, and Hill. Crown 8vo. Bound in Cloth. Price 3s. net. A detailed account of the fauna and flora of some well-known British natural history localities—Wicken, Deal, Chattenden, the Medway marshes, Freshwater, &c.

Woodside, Burnside, Hillside, and Marsh. Crown 8vo. Bound in Cloth. 242 pp. and 103 woodcuts and full-page illustrations. Price 2s. 6d. net. Descriptive account of well-known natural history localities (botanical, entomological, geological, ornithological), including Cobham, Cliffe, Cuxton, the Western Highlands, &c.

Stray Notes on the Noctuæ. Price 1s. net. An account of the classification of the Noctuid moths, etc.

Notes on the Zygaenidæ. Price 1s. 6d. An account of the habits, etc., of several species of the Alpine Burnet moths.

Some considerations of Natural Genera and incidental reference to the nature of Species. Price 1s. 6d. net. A detailed consideration of the nature of genera and species.

Some considerations of the Nature and Origin of Species. Price 1s. 6d. net. A detailed consideration of the causes that have led to specific forms and their isolation.

Some results of recent Experiments in hybridising Tephrosia bistortata and T. crepuscularia. Price 2s. net. Full account of experiments conducted by Dr. Riding and Mr. Bacot in hybridising these allied species.

The Drinking Habits of Butterflies and Moths. Price 1s. 6d. An interesting essay on the habit as observed in many parts of the world and its possible meanings.

The Nature of Metamorphosis. Price 1s. 6d. net. An essay on the nature of the various forms and degrees of metamorphosis in different orders of insects.

The Scientific Aspects of Entomology. Parts I. and II. 1s. each part, net. Critical review of the various scientific uses to which the work of entomologists may be put.

Catalogue of the Palæarctic Psychides. Price 6d. net.

Catalogue of the Palæarctic Lachneides. Price 6d. net.

Catalogue of the Palæarctic Dimorphides, Bombycides, Brahmæides, and Attacides. Price 6d. net. These give all the family, tribal, generic, and specific names, as well as those of all named varieties and aberrations most useful for labelling.

Reissue of Hubner's "Tentamen." (Only two copies of the original known.) Price 6d. net. A reprint of this rare pamphlet; of the greatest use to all lepidopterists interested in synonymy.

Postal Orders to be addressed to J. HERBERT TUTT, 22, Francemary Road, Ladywell Road, Brockley, S.E.

WATKINS & DONCASTER,

Naturalists and Manufacturers of Entomological Apparatus and Cabinets

Plain Ring Nets, wire or cane, including Stick, 1/3, 2/-, 2/6, 3/-. Folding Nets, 3/6, 4/-, 4/6. Umbrella Nets (self-acting), 7/-. Pocket Boxes (deal), 6d., 9d., 1/-, 1/6. Zinc Collecting Boxes, 9d., 1/-, 1/6, 2/-. Nested Chip Boxes, 7d. per four dozen, 1 gross, 1/6. Entomological Pins, 1/6 per ounce. Pocket Lanterns, 2/6 to 8/-. Sugaring Tin, with brush, 1/6, 2/-. Sugaring Mixture, ready for use, 1/9 per tin. Store-Boxes, with camphor cells, 2/6, 4/-, 5/-, 6/-. Setting-Boards, flat or oval, 1in., 6d.; 1½in., 8d.; 2in., 10d.; 2½in., 1/-; 3½in., 1/4; 4in., 1/6; 5in., 1/10; Complete Set of fourteen Boards, 10/6. Setting Houses, 9/6, 11/6; corked back, 14/-. Zinc Larva Boxes, 9d., 1/-, 1/6. Breeding Cage, 2/6, 4/-, 5/-, 7/6. Coleopterist's Collecting Bottle, with tube, 1/6, 1/8. Botanical Cases, japanned double tin, 1/6 to 4/6. Botanical Paper, 1/1, 1/4, 1/9, 2/2 per quire. Insect Glazed Cases, 2/6 to 11/-. Cement for replacing Antennæ 4d. per bottle. Steel Forceps, 1/6, 2/-, 2/6 per pair. Cabinet Cork, 7 by 3½, best quality 1/6 per dozen sheets. Brass Chloroform Bottle, 2/6. Insect Lens, 1/- to 8/-. Glass-top and Glass-bottomed Boxes, from 1/- per dozen. Zinc Killing Box, 9d. to 1/-. Pupa Digger, in leather sheath, 1/9. Taxidermist's Companion, containing most necessary implements for skinning, 10/6. Scalpels, 1/3; Scissors, 2/- per pair; Eggdrills, 2d., 3d., 9d.; Blowpipes, 4d.; Artificial Eyes for Birds and Animals. Label-lists of British Butterflies, 2d.; ditto of Birds' Eggs, 2d., 3d., 6d.; ditto of Land and Fresh-water Shells, 2d. Useful Books on Insects, Eggs, etc.

SILVER PINS for collectors of Micro-Lepidoptera, etc., as well as minute insects of all other families.

We stock various sizes and lengths of these Silver Pins which have certain advantages over the entomological pins (whether enamelled black or silver or gilt).

For instance, insects liable to become greasy and to verdigris like *Sesiidae*, etc., are best pinned on Silver Pins which will last much longer than ordinary pins.

We shall be pleased to send pattern cards on application.

SHOW ROOM FOR CABINETS

Of every description of INSECTS, BIRDS' EGGS, COINS, MICROSCOPICAL OBJECTS, FOSSILS, &c.

Catalogue (100 pages) sent on application, post free.

LARGE STOCK OF INSECTS AND BIRDS' EGGS (British, European, and Exotic).
Birds, Mammals, etc., Preserved and Mounted by First-class Workmen.

36, STRAND, LONDON, W.C., ENGLAND.

OVA, LARVÆ, AND PUPÆ.

The Largest Breeder of Lepidoptera in the British Isles is

**H. W. HEAD, Entomologist,
BURNISTON, Nr. SCARBOROUGH.**

*Full List of Ova, Larvae, and Pupae, also Lepidoptera, Apparatus, Cabinets,
etc., sent on application.*

Many Rare British Species and Good Varieties for Sale.

Lantern Slides in Natural Colours.

LEPIDOPTERA & LARVÆ A SPECIALITY.

Photographed from life and true to Nature in every detail.

SLIDES OF BIRDS, WILD FLOWERS, &c.,

By same Colour Process.

LANTERN SLIDES MADE TO ORDER FROM ANY SPECIMEN OR COLOURED DRAWING.

**PHOTOS IN COLOUR OF LARVÆ, LIFE SIZE, ON IVORINE
TABLETS TO PIN IN THE CABINET.**

For List apply to—

CHARLES D. HEAD, 2, Mount Vernon, Dollymount, DUBLIN.

Notice—Great reduction in Price.

It has been stated that many of our younger entomologists would be glad to possess the back volumes of the *Entom. Record*, if they could be bought at a lower price. Also that librarians might be glad to purchase the same. In order to see whether this be so we are temporarily reducing the price of complete sets of—

The Entomologist's Record and Journal of Variation. (Vols. I-XX.)

to £4, that is, at the rate of 4s. per volume. Single back volumes at 6s. per volume—any six volumes at 5s. 6d. per volume, or ten volumes at 5s. per volume. Odd copies of the magazine at published price (plus postage).

This is merely a temporary offer and will be withdrawn in a few weeks. It will, at any rate, give entomologists the chance of obtaining cheaply the finest set of Journals containing details of British and Continental collecting ever published. The early volumes deal almost entirely with British entomology, and collecting in the British Isles.

J. HERBERT TUTT, 119, Westcombe Hill, Blackheath, S.E.

THE THIRD VOLUME

OF

A NATURAL HISTORY OF THE BRITISH BUTTERFLIES,

THEIR WORLD-WIDE VARIATION AND GEOGRAPHICAL DISTRIBUTION.

By J. W. TUTT, F.E.S.,

The **third volume** of the above standard work, *fully and profusely illustrated*, will be published in **20 parts**, at **1s.** per part. These parts will contain a *monographic revision of the British "blue" butterflies*, confessedly the most difficult group of butterflies to deal with biologically, represented in the British Isles. For this work *life-histories* of each British species have been worked out at length, and *photographs of the different stages* of almost every species made from life.

Since the completion of the last volume, it has been necessary to revise the species in the group to which *Everes argiades* belongs; this has now been done, if not altogether so completely as one could wish, sufficiently for our purpose, and **Part I** is now to be obtained from Messrs. Watkins and Doncaster or Elliot Stock. The literature relating to some of the species is enormous, and we are fortunate in having persuaded the *Rev. G. Wheeler, M.A.*, author of the well-known "*Butterflies of Switzerland*," to aid us in the synonymic and more literary parts of our work. *All our former collaborators*, in addition, are helping us with the present volume.

The expense of *illustrating* this volume in detail will be so heavy, that we wish to secure as large a subscription list as possible. We are sure that those who know the work consider the illustrations a great improvement, but a larger subscription list is necessary if we are to expand as largely as is possible in this direction.

Subscribers for the 20 parts (in the last volume these extended to 25 parts at the same subscription price) is fixed at **17s. 6d.**, which must be paid direct to J. Herbert Tutt. Copies bought through the booksellers must be paid for at their face value per number. To ensure delivery as soon as published, subscriptions should be sent direct, and the following (or a similar) covering note forwarded therewith:—

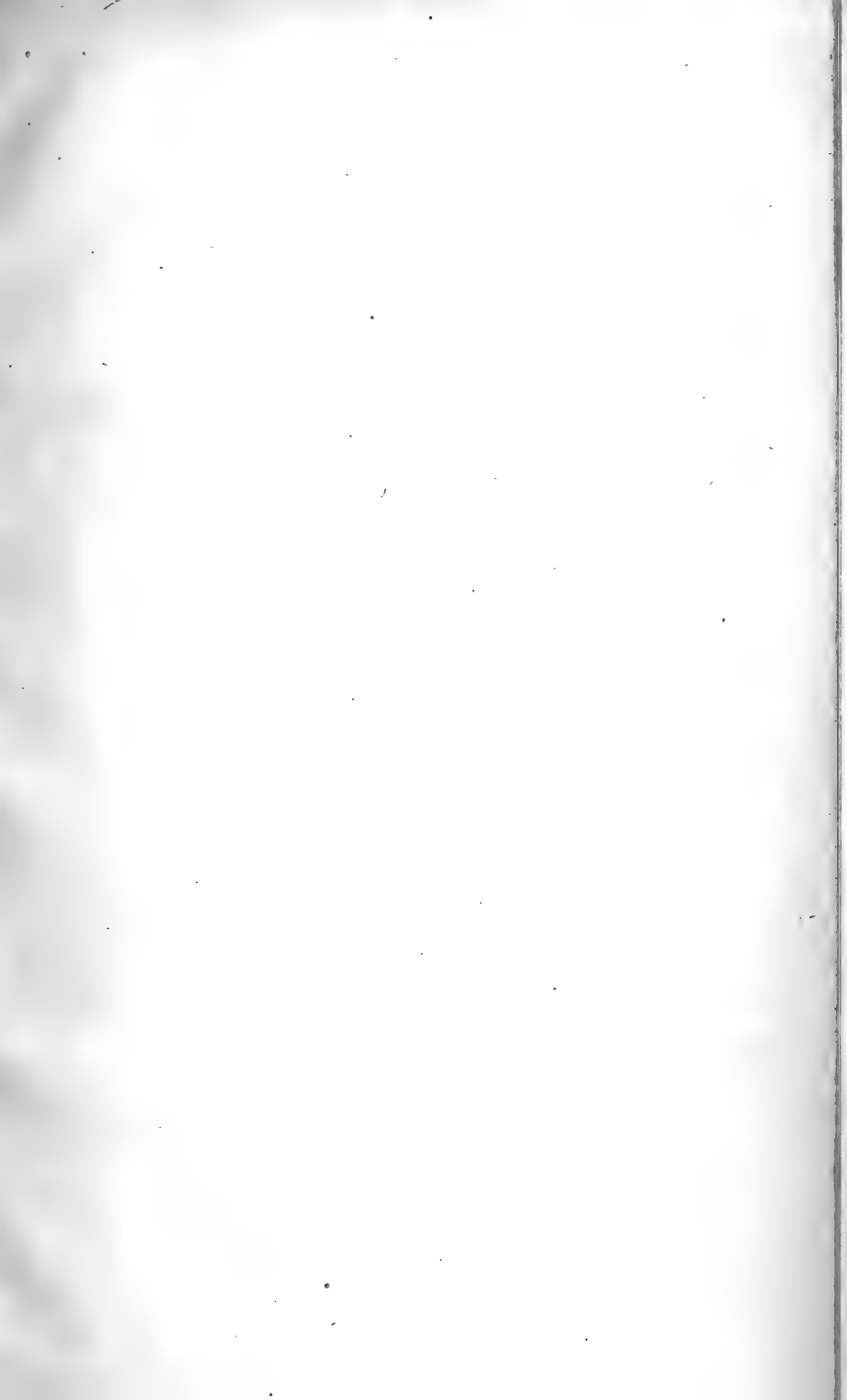
Please enter my name as a subscriber for the new series of 20 parts of *A Natural History of the British Butterflies*, for which I enclose postal order for 17s. 6d.

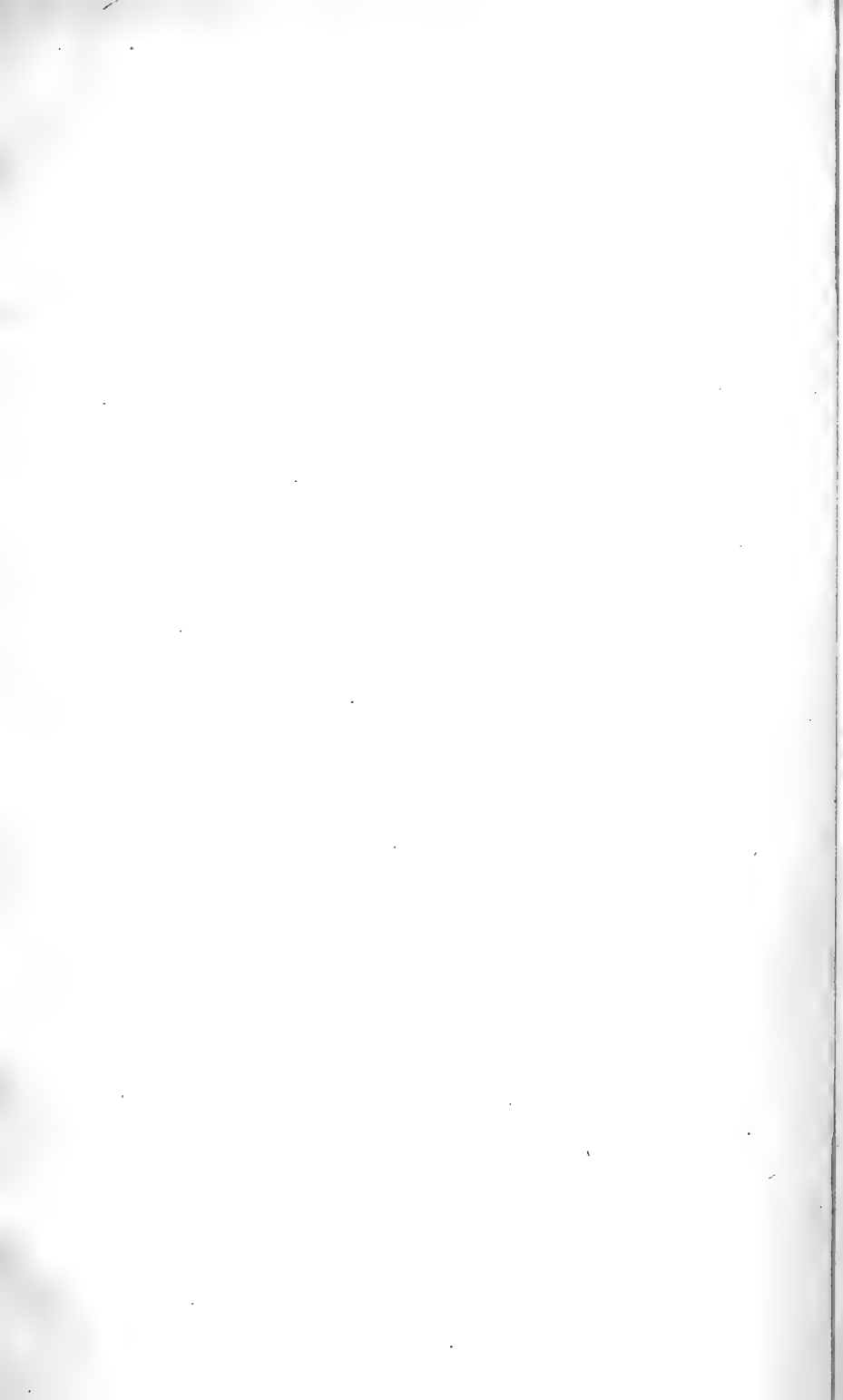
Name.....

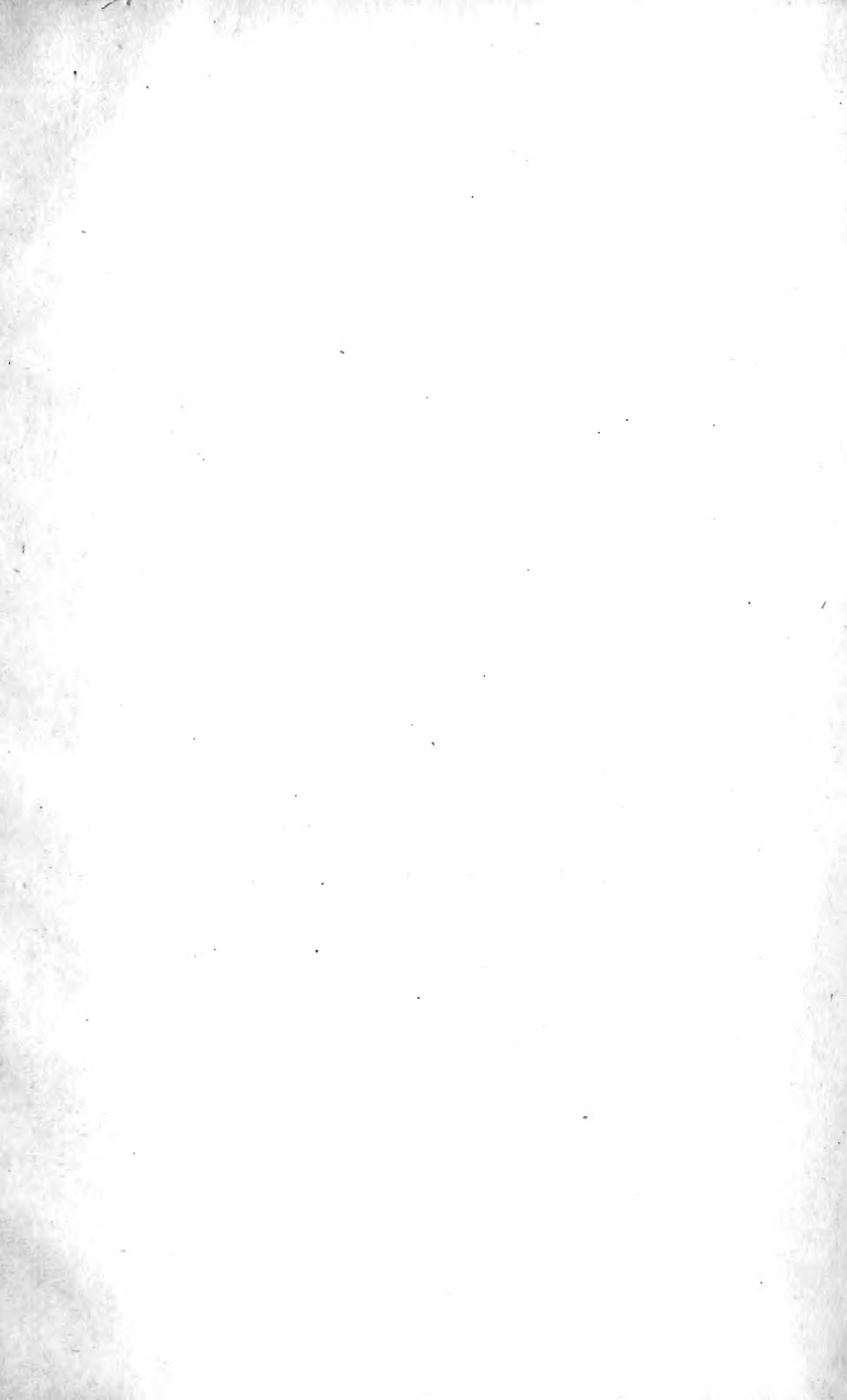
Address.....

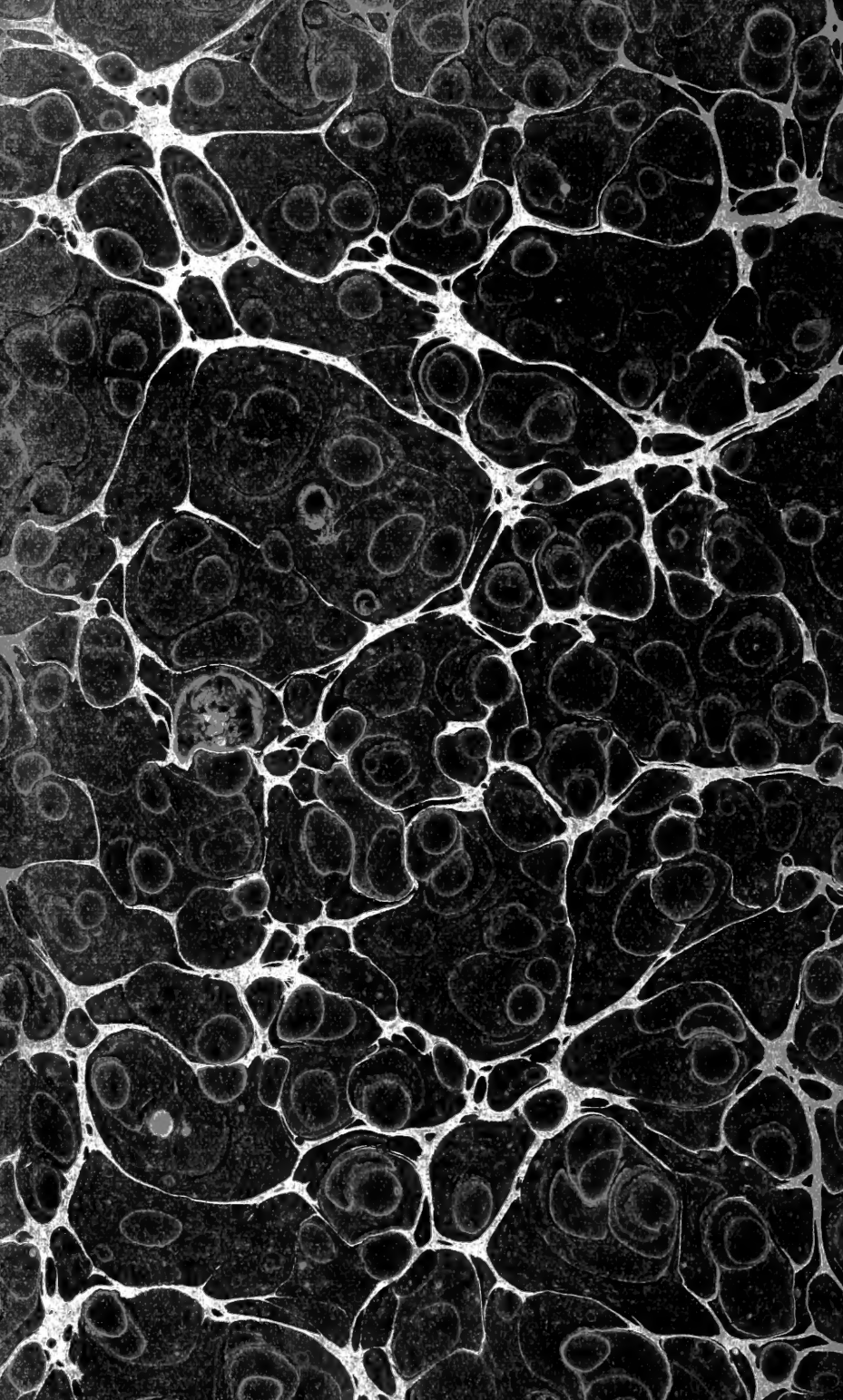
Date.....

J. HERBERT TUTT, 119, Westcombe Hill, Blackheath, S.E.









908.

SMITHSONIAN INSTITUTION LIBRARIES



3 9088 00908 3718